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Original Communications.

THE DIAGNOSIS OF PREGNANCY IN THE EARLY MONTHS.

ABSTRACT OF A CLINICAL LECTURE.

By Charles Jewett, M.D.,* Brooklyn, N. Y.

GENTLEMEN :—Little reliance is placed by most practitioners upon the signs of pregnancy in the early months. The patient who at this time propounds the question whether or not pregnancy has begun is usually dismissed with the protest that it is yet too early for any positive assurance in the matter, and this is entirely in keeping with the teaching of most writers on the subject. It is not my aim in these remarks to add anything new to our resources for diagnosis. A brief review of the signs of early pregnancy will show that the means already familiar are in the vast majority of cases sufficient for the recognition of pregnancy in the early months. Of first importance is the methodical plan of examination. Diagnosis in the earlier stages of gestation, as in most other lines of practice, rests upon no one sign alone, but upon the cumulative evidence of several signs. It is only, therefore, by marshalling all the diagnostic facts in the case that the greatest certainty can be reached, and this is possible only by precise and orderly method.

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Various classifications of the signs of pregnancy have been adopted by different writers. The most practical classification is that which groups them in the natural order of examination, as follows: 1. History; 2. Mammary changes; 3. Abdominal signs; 4. Pelvic signs. For our present purpose only the more important of the signs under each head will be considered.

Most practitioners, I am sure, attach too little importance to the history. Yet the arrest of the menses, especially when followed immediately by the peculiar nausea of early pregnancy, is sufficient alone to make the diagnosis in the vast majority of cases in course of the second month if all the facts are carefully weighed. True, histories are unreliable, and menstrual irregularities are common from other causes. But the credibility of the witness is not altogether an indeterminate quantity, and the morbid conditions which interrupt the menstrual function are, as a rule, easily appreciable. Give a woman in the active period of sexual life, whose menstrual habit has been previously regular, and who presents no appreciable evidence of disease, if she has missed her last period and within a week or two later has experienced more or less morning sickness, pregnancy is morally certain.

Mammary changes.—The mammary changes of pregnancy are in most cases sufficiently marked at the end of the second month to afford valuable evidence in women pregnant for the first time. The pathological reflexes which exceptionally give rise to such changes are not difficult of recognition, particularly if exploration of the pelvic organs is permitted. Increase in size and firmness of the glands, erectility of the nipples, hypertrophy of the glandular follicles, pigmentation, and the increased development of veins over the breasts are generally present at this time. Tumefaction of the glands begins during the second month, and is frequently more conspicuously marked in the second and third than in the subsequent months of gestation. Though the prominence of these changes differs much in different women during pregnancy, and while in exceptional cases one or more of them may be present from pathological causes, yet in a goodly proportion of first pregnancies a careful examination of the breasts will alone make the diagnosis at the end of the second month.

Abdominal Signs.—No important abdominal signs are available before the end of the third month. There is one sign, however, which begins to be perceptible from that time and which is of great value in the fourth month in cases complicated with uterine myomata, and in differentiating gestation from other fluid tumors, yet this sign is passed without mention by many systematic writers. I refer to the *choc fœtal*,—the shock of the fœtal movements as perceived by the ear. Since the fœtal movements begin about the twelfth week, the fœtal shock is obtainable from that time or soon after. It is not easily confounded with other sounds made over the abdomen. Though absent in occasional cases, when well made out it is not inferior in value to the fœtal heart-sounds, and is usually available at a much earlier stage of gestation than is the latter sign.

The uterine souffle of pregnancy usually dates from the fourth month, the time when the growing fundus reaches the abdominal wall. It may in favorable cases be heard much earlier by pressing the walls of the abdomen down against the uterus. Spiegelberg claims to have obtained the souffle in this manner as early as the eighth week. It should always be included in the examination during the third month. Frequently it is absent. Again, morbid growths, such as uterine myomata and even ovarian tumors, may give rise to a similar sŏuffle, but these growths, as a rule, may be easily excluded by the history and the physical signs.

Pelvic Examination.—The crucial test of the question of pregnancy in the early months is the examination of the pelvic organs by the conjoined manipulation. Among the most conclusive evidences of pregnancy in the second and third months are the changes which take place in the size, shape, and consistence of the uterus. These changes are best understood when it is remembered that they are the natural consequences of the lodgement and growth of the globular ovum in the uterine cavity. The body of the uterus gradually acquires the shape and the fluid elasticity of the growing ovum; its walls are rounded in all directions, but the expansion of the body is most marked antero-posteriorly, and most readily made out in the bellying of the anterior wall.

Pari passu with the early growth of the ovum, the body of the uterus becomes softened. This softening is most easily detected at the junction of the cervix and the body of the uterus, and particularly in the median line. If the non-gravid uterus be carefully palpated in the usual bimanual method, the fundus presents to the touch a body of nearly

uniform density throughout; the same is true of the cervix. In the body of the uterus, on the contrary, the median section is more resistant to the touch than its lateral borders. So marked is the difference of density in many cases that the uterus presents to the examining fingers a broad, hard mass corresponding to the fundus, another to the cervix, and a narrow, firm median column connecting them. In the second month of pregnancy this median ridge disappears. The softening which characterizes the gravid uterus is most marked in and near the median line of the body of the uterus and particularly at the isthmus. The median section of the corpus uteri, which is most resistant in the non-gravid state, is the first to soften in the early weeks of pregnancy. This point is of great value in deciding the question of pregnancy between the fourth and the eighth week. I had frequently directed attention to it in teaching before Hegar pointed out the softening and thinning of the lower uterine segment, and which have become known as Hegar's sign. Hegar's sign covers all there is practically in the point to which I have alluded, and as practised by his method is more conclusive. The introduction, however, of the fingers into the rectum and the thumb in the vagina to the depth required to grasp the isthmus uteri is awkward and painful,—without an anæsthetic often impracticable. For this reason it is hardly available for general use in private practice. Fortunately the recto-vaginal method of Hegar is seldom necessary. Yet it may be of great service when the conditions cannot be satisfactorily made out by the usual method.

In difficult cases, examination with the index-finger in the vagina, the second finger in the rectum, may be practised, in addition to the usual bimanual method, more easily than Hegar's. This method will be found especially useful in retro-displacements of the uterus, when it is difficult or impossible to palpate the body in the ordinary conjoined manipulation. The fundus is pushed backward by the external hand and the entire posterior surface of the body and fundus may then be mapped out by the rectal finger, and the size, shape, and, to a great extent, the consistence of the uterus may be accurately appreciated. If necessary, to facilitate the manipulation, the uterus may be drawn down with a volsella held by an assistant. It is true, the physical changes in the uterus which belong to early pregnancy are closely simulated by certain morbid enlargements, such as chronic metritis, subinvolution, and hyperæmic swelling with anteflexion. But in chronic metritis and in simple hypertrophy the uterus is more resistant than in gestation. This is also true of fibromata, which are further distinguished by the nodular shape of the uterus in subperitoneal growths and by the history of hemorrhages in interstitial fibroids. In subinvolution the enlargement is mainly in length, and all pathological enlargements are distinguished by absence of the fluid elasticity of the gravid uterus and the progressive development of the changes characteristic of pregnancy. Cases are rare in which pathological enlargement of the uterus cannot be readily excluded by the practised touch. To the expert examiner and in first pregnancies, if uncomplicated, the diagnosis is possible in every case as early as the sixth week by the bimanual palpation of the uterus.

Among the pathognomonic signs of pregnancy is the detection of fœtal parts and fœtal movements by palpation. By the abdominal examination it is rarely possible to map out and identify the parts of the child or to perceive movements till midpregnancy or later. By conjoined manipulation movements may frequently be obtained at or soon after the end of the third month, and fœtal members may be made out a little later. Yet this method of examination is seldom mentioned in text-books on obstetrics. This sign, like the *choc fœtal*, while not strictly pertinent to the subject of these remarks, I mention because of its value for the recognition of pregnancy in the presence of complications and for differential diagnosis. I have been able to demonstrate the fact of pregnancy in the presence of uterine myomata by detecting fœtal movements by bimanual palpation, in the absence of all other conclusive signs. With the body of the uterus balanced between the examining hands, movements of the child can hardly escape detection, and if the attempt fails for a time, tossing the fœtus with the fingers of the internal hand will frequently provoke movements when they cannot be otherwise elicited. Active movements, however, are not always obtainable, not at least by a single examination even in more advanced stages of gestation.

In conclusion, then, with the exception of occasional cases in which a satisfactory examination is rendered impossible by reason of unusual complications or difficulties, a positive diagnosis of pregnancy is possible

in the majority of cases before the end of the fourth calender month by the *choc fœtal*, active fœtal movements, and the mapping out of fœtal parts by the bimanual examination.

A declaration of pregnancy is frequently possible as early as the end of the third month.

The diagnosis of pregnancy is almost absolutely certain between the eighth and the tenth week.

In a large proportion of cases the evidence is conclusive before the end of the sixth week.

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*THE PATHOLOGY OF CARCINOMA.**

By Heneage Gibbes, M.D.†

THE subject of carcinoma is one of intense interest to the medical profession, both from the deadly havoc it makes in our patients and from our inability to cope with it when occurring in any site unfavorable for surgical interference. We are at the present time entering what may be termed a new era in the treatment of disease, and it is with the hope that in the near future we may be able to devise some method of treatment by which this dread disease may be arrested in its earlier stages, that I bring before you a subject with which you are all so familiar.

To study this disease thoroughly it is necessary to take it in detail, and to do this I will first classify it according to its morbid anatomy, then take its effects locally and secondarily, and finally the functional change produced in the parts and the etiology of the new growth.

Carcinomata may be divided into three classes, if judged by the epithelium from which they are developed, and by the structure of the new growths produced, and the epithelium from which carcinomatous neoplasms are derived is, in every case, developed from either the epiblast or hypoblast. The new growths are, therefore, always epithelial in type, and there is a sharp distinction between them and those of mesoblastic origin or connective-tissue type. The minute structure of carcinomata separates them into three groups :

1. Squamous epithelioma.
2. Columnar epithelioma.
3. Glandular carcinoma.

In the squamous epithelioma we have new growths, which are derived from epithelium, the arrangement of which in those parts where new growths most frequently arise is that of stratification ; there are many layers of squamous cells, and the function of these cells so arranged is mainly that of protection to the parts lying beneath.

In a squamous epithelioma we find that this stratified epithelium has grown into the cutis vera, at first in large masses, which grow irregularly, but gradually become thinner, until they are composed of only one or two cells in thickness.

We know that a chronic intermittent irritation, such as that of a tight- or ill-fitting boot, will cause an increased growth of the epidermis, but this is always outward. We never find that the newly-formed epithelium has penetrated the layer of cement substance that fastens the epidermis on to the corium and grown into the structures below it ; there is, then, a vast difference between the hypertrophied epithelium of a corn and an epitheliomatous growth.

But we also know that the dermal appendages, such as hair-follicles, sweat-glands, and parts of the teeth, are developed by a down-growth of epithelium. We have, then, in the formation of an epithelioma of the squamous type, a return to the fœtal condition, in so far that the influence, whatever it may be, which produces the new growth causes the normal epithelium to increase and grow downward in a similar manner to that which took place in fœtal growth, differing, however, in that the growth is now an abnormal one, endless, erratic, and without a definite object.

The function of normal stratified squamous epithelium is protective and not secretive, and its chemical reaction differs from that of secretive epithelium. This is easily shown by making vertical sections through the base of the tongue of a dog. Some of these will show one of the ducts of the mucous glands, which are numerous in this situation, cut longitudinally.

If one of these sections is now carefully stained with two colors which will not combine, such as rosanilin hydrochloride and iodine green, the protective or squamous epithelium of the tongue will be found passing into the mouth of the duct for a short distance, and will be sharply differentiated by the green stain from the secreting epithelium, which has taken the red color.

Another point in the normal condition of stratified squamous epithelium is the tendency it has under certain conditions to undergo a

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* Read before the Pathological Society of Philadelphia.

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horny change, by the transformation of its superficial cells into keratin. This is seen normally in the formation of the nails and the horny papillæ in the tongue of the cat.

We have, therefore, in an epithelioma a down-growth of squamous epithelium in a somewhat similar manner to the down-growth which takes place in fœtal development, and this epithelium has no secretive function, but has a tendency to undergo horny change.

In studying these growths, we find that they may be divided into those that have a large corneous formation and those that have little, and we find, further, that those with a good deal of horny change have been of slower growth than the others.

The new growth consists of stratified squamous epithelium. This is continuous with the normal epidermis when it has been derived from that source, and the cells forming the ingrowth are found to be stained more deeply on the outside of the mass than those in the centre, the outer cells being directly continuous with those of the rete Malpighi, and having the same reaction. In some parts we find the so-called nests or pearls. These are formed by the outgrowth of a secondary trabecula from the primary, which, in a vertical section of the growth, is cut transversely, giving the concentric arrangement. The outer cells of the nest are the active ones. They stain deeply, and correspond to those of the rete Malpighi in the normal epidermis. In some epitheliomata the proportion of corneous cells is very large, and they appear as yellow masses in a logwood-stained section.

The next variety is the columnar epithelioma. This starts from parts that normally consist of a single layer of columnar cells on a basement membrane, and the majority of these have a secretive function of a simple kind,—that is, the formation of mucus. The pyloric glands of the stomach, Brunner's glands, and similar glands which exist in the neighborhood of the ilio-cæcal valve, are compound tubular glands lined with columnar cells, which appear to have a higher secretive function than those lining simple Lieberkühn follicles. They all, however, have long ducts lined by columnar epithelium, and it is not certain whether columnar epitheliomata arise from the duct or the glandular epithelium when occurring in these parts.

New growths from these cells require a separate class from their structure and development. They are developed normally from an ingrowth of the hypoblast, and with two exceptions are situated in the mucous membrane, Brunner's glands and those near the ilio-cæcal valve being in the submucous coat below the muscularis mucosæ.

A columnar epithelioma consists of a new growth of columnar epithelium originating from that in the Lieberkühn glands or ducts of compound tubular glands, and in the new formation simulates the arrangement of normal columnar epithelium,—that is to say, the new growth is composed of tubes lined by columnar cells, but this tubular arrangement is very irregular. The epithelium is always on a basement membrane, and there is always a lumen to the tube, however irregularly it may be formed.

The new growth is always outward from the lumen of the part in which it starts. As in development the glands are formed by a dipping downward of the epithelium, so in the formation of these new growths there is an exaggeration of the fœtal condition.

There is, therefore, sufficient difference in these forms to make a distinct class.

The next variety is the glandular carcinoma. It is derived from epithelium in which the secretive function is at its highest development. These cells take from the blood, which is brought by capillary vessels into close proximity to them for that purpose, what materials they require, and by virtue of their protoplasm elaborate a substance which is the secretion of the gland of which they are the functional elements. They are situated on a basement membrane in single rows, and they pour their secretion into the lumen of the gland, the acini of which they line.

This description does not apply to the liver, but is it certain that primary carcinoma is ever developed, in that organ, except from the bile-ducts?

The minute structure of all glandular carcinomata is the same, and differs from the two forms already described in having a fibrous stroma forming a net-work, the interstices of which are filled with masses of cells, continuous throughout.

These glandular carcinomata are formed by germination of pre-existing gland-cells, the increase being towards the lumen and not outward, as in the other forms.

There are two kinds of glandular carcinomata,—one soft, the other hard. Their structure is the same, but one is of rapid growth, and contains a large amount of cells and little stroma, while the other is of slow growth, and contains a large amount of fibrous stroma with comparatively few cells.

For the purpose of investigating the struct-

ure of these growths, the mammary gland is the most suitable part, from the frequency with which the disease occurs there, and

Cancer of mammary gland. Germinating epithelium growing inward and filling up the acini; × 120.

from the ease with which the parts can be obtained in a perfectly-fresh condition, after operation.

When microscopic examination of a number of these cases is made, it is at once apparent that a great difference exists between them, no two being exactly alike.

The type on which they are formed is, however, always the same: as new cells are developed by the germination of the normal cells, under an abnormal stimulus, the same influence is extended to the connective tissue forming the frame-work of the gland, and this throws off fine processes which grow between the newly-formed cells and form the fibrous net-work. These fine trabeculæ consist, in the first place, of a capillary blood-vessel, with a small amount of fibrous tissue surrounding it, so that from the first the newly-formed cancer-cells are separated from the blood-vessels by a varying amount of fibrous connective tissue; that is to say, the naked capillary vessel is never in absolute contact with the neoplastic cells, as is the case in a sarcoma or mesoblastic neoplasm. This is an important point, as it affords a criterion for the differential diagnosis between sarcoma and carcinoma, and also explains the difference existing in the formation of secondary growths in these two neoplasms.

Encephaloid cancer is a rare form in the mammary gland, and, in fact, everywhere. Formerly it was considered to be common, but extended and more scientific observation has shown that most of the so-called encephaloids were really large, round-celled sarcomata.

We have, therefore, judging by the morbid anatomy, three forms of carcinomata, which are entirely distinct from one another.

One formed of squamous epithelium, which is avascular, and is nourished by the lymph in the same manner as the normal epithelium from which it springs.

Another composed of columnar cells, arranged on a basement membrane, mimicking the normal arrangement of the cells from which it is derived.

And the third, composed of masses of cells, with a net-work of fibrous tissue running through them and carrying blood-vessels for their nourishment.

The first two follow the type of fœtal development in their growth, the last does not.

I will now consider the method of growth locally, and the manner in which secondary growths are produced. As I have already said, epithelioma is simply a downward growth of stratified squamous epithelium. But when we examine a large number of these new growths, we find that among many minor differences there is one which is so marked as to constitute an essential characteristic in the morbid histology, — that is, the amount of horny change.

A number of these growths will be found in which the corneous change is very marked, which is shown by the round or oval masses, looking yellow in a logwood-stained section; the cells composing them appear to be dried up and to have lost their vitality. Around these masses, but generally separated from them by a small space, are a number of cells of epithelial type, which react to logwood in a normal manner.

Other growths show this horny change only in a slight degree; they contain no horny masses, and only a few of the central cells in a trabecula show evidences of keratoid change. Clinically, these two forms can generally be differentiated by the length of time they have taken to grow.

Their mode of growth, when once started, is, however, the same in every case.

If we take a few examples of those epitheliomata in which the corneous change is

well marked, we shall find some interesting facts.

We will take three cases, which differ widely. First, a typical soot cancer, or epithelioma of the scrotum, occurring in a chimney-sweep, which was of slow growth. These cases are now rare, as the demand for soot as a fertilizer is much less than it was formerly, and chimneys are swept by machinery. We must consider that the irritation caused by the soot was in these cases the starting-point of the new growth. We find, on examining a case of slow growth, that throughout it are large yellow masses of altered epithelial cells, while round these, but sharply defined from them by their reaction to the logwood stain, are a number of cells of epithelial type, and from these are processes, formed of similar cells, running in every direction, but gradually becoming smaller, until they consist of only one or two cells.

Next we will take a growth showing that it originates, in the first place, from an injury.

In this case, twenty years before the case came under observation, a slight injury to the back of the hand resulted in a dry, horny growth. After a time this was removed, and was succeeded by a number of smaller horny growths, the whole only covering a space of about three-quarters of an inch in diameter. This remained for a number of years, until muriatic acid was freely applied, with the result that the growth rapidly increased until nearly the whole of the back of the hand was involved, necessitating its removal by amputation. This growth showed on microscopical examination the same appearances as those described in the case of soot cancer.

Another case differed from these two in that there was no history of any exciting cause.

A woman, aged 60, stated that a growth of a hard, warty nature had existed in the inguinal region ever since she was a young girl. She was positive that there had been no treatment of any kind. Shortly before she came under observation she noticed that the inguinal growth had become much larger, and was increasing rapidly. At the same time she found that a tumor was forming in the labia, and was also rapidly growing. Both of these were removed. The first showed the horny formation already described; the second consisted entirely of squamous epithelium, growing in the irregular manner usually found in an epithelioma which is rapidly increasing. There were no horny masses in it, but here and there a few cells could be found which had undergone a horny change in a slight degree. Whether this pudendal growth was secondary to that in the groin is not clear, but from several small blood-vessels ending abruptly in masses of epithelial cells, it would seem that the infection had been carried by the circulation.

In studying these varied cases, it becomes evident that an increased growth of epithelium, which undergoes a horny change, may take place and exist for years without being in any way an epithelioma, and this is proved by other cases which I have examined when a long-standing growth was removed, which, on microscopical examination, proved to be entirely composed of horny epithelium, with no trace of cancerous formation. On the other hand, these corneous epithelial formations seem to have the power of setting up cancerous growth when a direct stimulus is applied, as in the case of muriatic acid; or, when they have existed for many years, the same change may take place from causes of which we are unable to find any evidence.

An interesting point in the formation of these cancerous conditions from horny epithelial growths is that, although the cells of which they are formed seem to be effete and to have lost their vitality, they must in reality possess powers of germination, as they exist in the cutis vera far from any epithelial cells, and the new growth is seen to be derived directly from them.

Epitheliomata which arise on the hands or arms of tar- or paraffine-workers, or in the tongue from the irritation of hot tobacco-smoke, do not, as a rule, show these horny masses, but the central cells show evidences of having undergone more or less keratoid change. When, however, an epithelioma has arisen from the oral mucous membrane, the cells of which it is composed are large, and resemble those found normally in that position, and they retain these characteristics throughout the growth.

Whatever differences may exist in the formation of the primary growths, the production of secondary growths is always brought about in the same manner, commonly by the lymphatics, rarely by the blood-vessels. As these growths send processes into the depths of the tissue, these gradually become smaller, and, naturally following the line of least resistance, work their way into the lymphatic spaces, when they finally become reduced to a line of single cells. One of these easily becomes detached, and is carried away by the lymph-stream. These down-

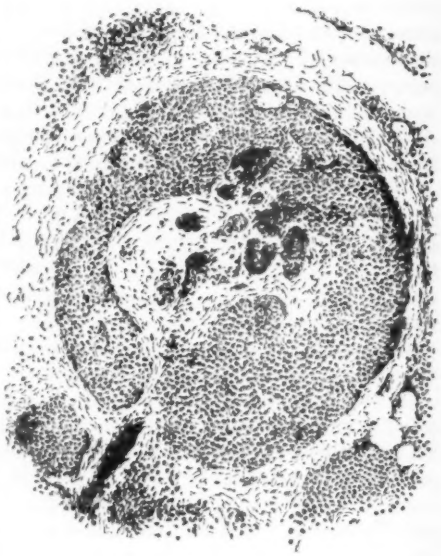
growths, however, grow slowly, and secondary infection is long in taking place.

The Columnar Epitheliomata.—The growth is an outward one from the lumen, and there is no proper stroma formed, the new growth pushing its way among the existing tissue, but always retaining the same formation,—columnar cells on a basement membrane. When a growth of this kind occurs at the pylorus, the whole mass of non-striped muscle forming the sphincter becomes permeated by it. In the liver these growths start from the epithelium of the bile-ducts. In some cases irregular growths of this kind are found, which closely resemble the dilatation of the bile-ducts produced by psorospermiæ in the liver of rabbits. It is possible that some of the cases which are considered to be columnar epitheliomata may be produced in a similar manner.

Columnar epithelioma of the liver. May possibly be of parasitic origin; × 130.

The method by which secondary growths are produced from these columnar epitheliomata is not clear, and so far I have been unable to get any satisfactory evidence of the route taken by the infecting material.

The Glandular Carcinomata.—The action of the stimulus which causes germination of the secreting epithelium also causes a growth of fibrous tissue, and in this way the net-work is formed with the cells in the interstices, and the blood-vessels in the fibrous trabecula, the normal condition of the gland being entirely altered. This is the usual course in a scirrhus carcinoma. There are, however, rare forms occurring in the mammary gland when each acinus becomes filled with newly-formed cells, derived by germination from the normal cells, but without any fibrous stroma running between them. This is, however, I think, only an early condition, as in some cases this arrangement can be found in one part, while another near by may contain a typical scirrhus. One thing, however, that is worthy of notice is, that the epithelium of the ducts remains intact among the cancer cells, and shows that its reaction is different by the way it takes the logwood



Cancer commencing in an acinus of the mammary gland; × 130. The ducts remain in the centre unchanged, and have a different chemical reaction to the cancer cells.

stain. The method by which these glandular alveolar carcinomata are reproduced as secondary growths, in the nearest lymphatic glands, is a very interesting one. As is well known, secondary growths in the nearest lymphatic glands occur early in the course of the disease, and this is a natural consequence from the formation of the growth itself. The cells are in masses, in direct contact with the stroma, and the blood-vessels are situated in the stroma, and separated by it from the cells. Therefore it is a difficult matter for a cancer cell to get into a blood-vessel. Consequently dissemination by the blood-stream is not the manner in which secondary growths are produced. If they were, they would occur late in the course of the disease, as is shown in sarcomata, where, although the blood-vessels are in direct contact with the cells of the new growth, dissemination throughout the body does not occur in the earlier stage, but when it does is very general.

Secondary growths in glandular carcinomata are produced by the passage of cancer

cells from the primary neoplasm, through the lymphatic channels in its stroma, to the lymph-vessels of the affected gland, and through them to the nearest compound lymphatic glands.

I base this statement on a careful examination of five cases, where the mammary gland was removed in the earliest stage of the disease,—that is, within a few days of its first discovery by the patient,—and where the whole mammary gland, together with the pectoral and axillary glands, were removed without their connection being separated.

The method adopted in each case was this: All the parts removed were placed at once after operation in Müller's fluid, and brought to my laboratory. They were then carefully dissected out, and each part placed in a separate bottle and labelled. After they were properly hardened, sections were made of each part and examined separately. The results were carefully noted in each case, and then the five cases were compared.

The facts established were these: In the first place, the stroma formed in a glandular carcinoma is composed of fibrous connective tissue, and the elements of this are arranged in a similar manner to that of normal tissue,—that is, in a more or less felted manner,—whereby spaces are left between the fibrils, which are filled with lymph, and are parts of the lymph-canal system of the body. Now, these lymph-spaces are directly in contact with the masses of cancer cells. Consequently it is an easy matter for one or two cells to separate themselves from the parent mass and enter a lymph-space, as they probably possess more or less amœboid movement. And that they do this is very plain, as numbers of these lymph-spaces can be seen containing one or two cancer cells. The current in the lymphatic system is always from the periphery towards the centre, and there exists, therefore, a *vis à fronte* sufficient to draw these cells onward directly they have entered the lymph-channels. As soon as these channels are passed and a formed lymphatic vessel entered, the valves, always existing there, prevent the possibility of any return, and also insure an onward progress.

The lymph-vessels themselves are so small and of such delicate structure that I have been unable so far to demonstrate the presence of cancer cells in their course; but, taking their termination in the capsule of the compound lymphatic gland, it is an easy matter to show them filling the lumen of the vessel, and passing along the lymph-paths of the gland itself. Their chemical reaction is so different from normal lymph-cells that my logwood stain picks them out at once. I think from these

Section through the periphery of an axillary lymphatic gland. The mouth of the afferent lymphatic vessel is distended by a mass of cancer cells brought by it from the primary neoplasm; × 220.

observations, which have been carefully carried out, I am justified in saying that the primary cells of a glandular carcinoma occurring in the mammary gland do pass through the lymphatics to the nearest compound lymphatics, where we know secondary growths are most commonly found.

I also consider that this takes place in a very early stage of the disease, as in these five cases, taken as early as possible after the morbid process had declared itself, there was not one in which the highest axillary gland—that is, the one situated farthest from the primary growth—was not affected with the disease. This seems to be a most significant fact, and early operation would appear to be imperative. The after-history of these cases shows that sometimes the disease is entirely eradicated, while in others it is not. I think the explanation of this must be that in these cases the cancer cells take a somewhat different course to that generally followed, through the pectoral and axillary glands, and either pass through the sternal glands, along the line of the internal mammary blood-vessels, or they must pass entirely through the chain of axillary glands to the subclavian vein or thoracic duct.

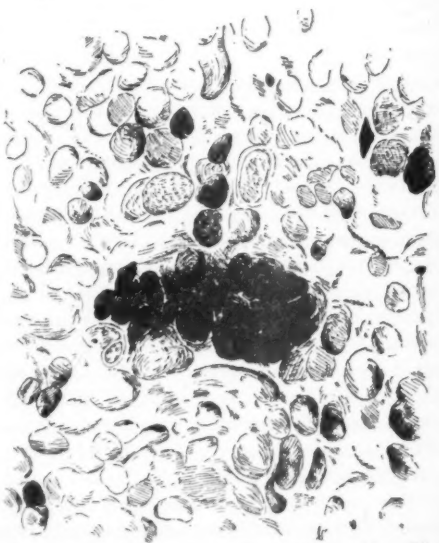
It is, however, certain, that in the majority of cases the disease is confined in its earliest stages to the primary growth in the

gland itself, and the secondary in the pectoral and axillary glands. There is, however, no reason why a cancer cell cannot travel the whole range of these glands and get into the blood, provided the change produced by the secondary growth has not involved and altered the whole of the normal structure of the gland. When this is done, the whole gland is changed into cancerous tissue, all afferent and efferent vessels are obliterated, and the growth itself is confined by the dilated capsule of the original normal gland.

The next point to consider is the change that takes place in one of these compound lymphatic glands when invaded by cancer cells. It is necessary to remember the normal structure of the glands in question. They have a fibrous capsule, into which the afferent vessels open, and through channels in it pass the lymph into the sinuses in the gland itself. These are occupied by a coarse adenoid tissue, and the follicular masses containing the lymph-capsules are separated from them by a fenestrated membrane. We have, then, an organ the constituents of which are all, so far as we know, of mesoblastic origin, and which is permeated by sinuses arranged to carry the lymph brought by the afferent vessels through these sinuses, enrich it in its passage with numbers of ripe lymph-capsules, and discharge it at the hilus into the efferent vessel. There is one point in connection with the histology of these glands on which embryologists have not yet enlightened us. I mean as to the origin of the large flat epithelioid cells which lie on the nodes of the adenoid reticulum. These cells are epithelioid in character, and if their origin should be found to be epithelial, it would help to clear up some obscure points in morbid histology. When the cancer cells carried from the primary growth enter the sinuses of the lymphatic gland, they pass along for some distance, but soon get fixed in the meshes of the coarse adenoid tissue. As soon as they become stationary they begin to develop a secondary formation, the protoplasm increases, and the nucleus divides, until a large multinucleated mass of protoplasm is formed. Differential staining at this stage shows some peculiarities in the chemical reactions of these cells and in their structure. Using red and green aniline colors, which will not combine, these large multinucleated masses of protoplasm take the red stain deeply, and examination with high powers shows no structure in the majority of the nuclei. One or two, however, in the mass will be found that have taken the green color. They are situated at the edge of the mass, and their nuclei show

Cancer cells having passed into a lymph sinus in an axillary gland have germinated and distended the sinus; × 130.

well-marked convolutions; the protoplasm also surrounding them is seen to be separating from the mass. On examining the structures lying between these multinucleated



Secondary cancer in an axillary gland; × 660. The dark mass has been formed by the germination of a cancer cell; the high cells at the edge have separated from this mass.

masses, a number of large single cells are found, containing large nuclei, with well-marked net-works in them, and they have all taken the green color. Further careful examination will also show some of these cells, in which the reaction is changing again to the red and the nucleus is becoming opaque. The explanation of this seems to me to be that a cancer cell deposited in a lymphatic gland is in the active stage, the protoplasm increases, the nucleus divides, and finally there separate from the mass individual cells, which then pass into the resting stage for a time, and their reaction to staining agents shows that their chemical composition varies in these different stages. I have found precisely similar changes in secondary growths in the liver and other parts. These peculiarities in the germination and in the chemical reactions at different stages are of interest, and tend to show that these abnormal cells still retain normal qualities.

There is an interesting point in connection with secondary growths from squamous epitheliomata occurring in the portio vaginalis. Some authorities consider that a carcinoma in this situation does not produce secondary growths in the uterus, but in the vagina. I have recently examined two cases which disprove this. Curettings were made on account of persistent hemorrhage, and on examining them I found a hypertrophic condition of the mucous membrane. In each case the curettings were from the fundus. Judging only from the appearances presented by the mucous membrane, these were cases of so-called adenoma of the uterine glands, but on careful examination of the deepest parts removed, I found squamous epitheliomatous cells in the blood sinuses. These cells had been carried backward towards the fundus, had then grown towards the surface, and the irritation set up by their growth had caused hypertrophy of the mucous membrane,—the so-called adenoma. Death occurred in each case some months afterwards, and this condition was verified. It seems to me that some of the villous growths in the bladder may be explained in the same way, although in a large number examined by me that were removed during life by Sir Henry Thompson, I was unable to find any evidences of carcinoma, but, considering the great length of villous growths in this situation, the cancerous tissue may not have been reached.

The next consideration is the causation of these cancerous growths.

I have already shown that in the secondary formations arising from these, the epithelium of which they are formed is always of the same kind as that existing in the part where the primary growth first begins. That is, a neoplasm starting from squamous epithelium is formed entirely of squamous epithelium. Another, starting from glandular epithelium, is always formed of epithelium resembling that found in secreting glands. A squamous epithelioma does not in any case contain columnar or glandular cells. We know that the normal cells are formed from cells in either the epiblast or hypoblast, and we cannot distinguish between these cells in their embryonic condition, but as they develop and form the different adult conditions, some become squamous with a protective function, others glandular with a secretive function. Judging from the results produced by abnormal action on these adult cells, producing a neoplastic growth from them, we may consider that in their adult normal condition they have reached the highest point in development for which they were destined, as we never find, when an abnormal stimulus is applied to them, causing them to take on abnormal growth, that they pass into a higher stage, no squamous cells ever becoming glandular. This is an important consideration, as it shows that, whatever the cause may be which brings about the cancerous change in epithelial cells, its action is merely to cause increased growth in them. That it may, however, have an important effect on glandular epithelium as regards its function is highly probable; for, unless we consider that the cancerous influence has affected the secretive function of glandular cells in such a manner that they produce in their abnormal condition something deleterious to the person affected, we cannot explain the marked cachexia produced in many cases.

In studying the etiology we have, therefore, a condition where some unknown influence acts on certain cells and causes them to grow, slowly in some cases, rapidly in others, and in those cells having a secretive function this is probably altered.

There is, however, a further consideration. Each cell formed under this abnormal influence is endowed with the property of increasing by division, wherever it may be carried, at the expense of the tissues in the part where its course is arrested; and more than this, it carries with it the power of producing changes in the cells formed by its germination, which may be either normal or abnormal. This is shown in the keratoid change

set up in single cells in the secondary growths in squamous epithelioma, and in the colloid change of the cells in columnar epitheliomata, where the primary growth was subject to that degeneration.

Various theories have been advanced to account for the growth of neoplasms. Among these, Cohnheim's embryonic remains was at one time thought to explain matters, but further investigation showed that it was based, in the first instance, on an abnormal condition, and was untenable.

The doctrine of altered physiological resistance also met with some favor, but a thorough knowledge of the histological conditions and the primary changes set up in them by cancerous growth deprives this theory of any basis.

The latest view is that advanced by Dr. Russel, of Edinburgh, who describes a characteristic organism of cancer. He here makes two assumptions, which he does not prove,—first, that it is an organism ; second, that it is characteristic of cancer. Both these assumptions have already been abundantly disproved. The so-called organism exists in large numbers in every case of syphilitic warty growth that I have examined, and it consists of what look like broken-down nuclei which have no resemblance to any organism, vegetable or animal.

There are some workers who are now investigating this disease with the confident hope of proving its bacterial origin. Now, I would ask, does it seem probable that any organism could have the power of exciting new growth in cells of such varying character, yet which in each case retains its individuality, and further transmits to all the new cells formed in its growth certain peculiarities, and in some cases morbid changes, as in the colloid degeneration of columnar epithelioma?

Are we to understand that the action of an organism on the original cells from which the growth first springs can be of so potent a character that it can impart to these cells peculiarities which they are then able to transmit to all the numbers of cells formed afterwards from their germination? This does not seem possible, and, if it were the case, we must imagine a different organism acting in each of the varieties of carcinomata.

Numerous experiments have been made for the purpose of testing the possibility of communicating the disease from the human subject to healthy animals, and they have all proved futile ; but there are experiments on record which would seem to prove that it is possible to transplant a portion of cancerous material from one part of an affected patient to another part of the same patient without destroying its power of growth.

Does not this show that these cells have in themselves no inherent power of increase, but that there must be a peculiar condition of their environment by which they are enabled to live and grow? In epithelioma of the skin, it is easy to find cases where the newly-formed epithelium has grown in the cutis vera a long distance from its starting-point. In many instances it can be shown to have grown almost into contact with the normal epidermis over it, but this is not in any way affected by the proximity of the new growth. So that the influence, whatever it is, acted at one point only, and affected the cells there, giving them the power of infecting their descendants, but not other normal cells.

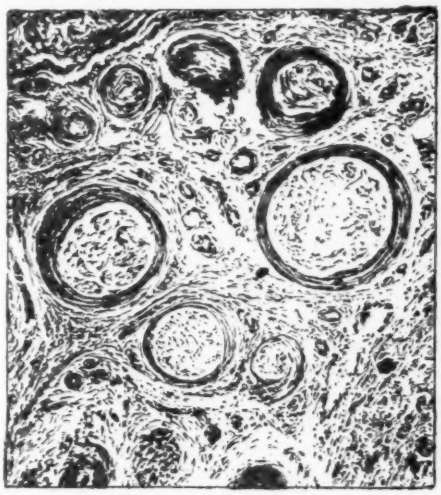
This would seem to prove that only certain cells of any particular kind are liable to be influenced by the conditions which cause cancerous growth. This view is further corroborated by the fact that in the mammary gland a large portion may be entirely changed by fibrous degeneration, while some portions involved in this degenerative process may be changed into cancer tissue ; yet other parts do not show this change.

Some authorities have advanced a theory that cancer cells can exert what they call spermatic influence on normal cells of any kind, transforming them into cancer cells. If this were the case, the secondary growths in their earliest stages, in such organs as the liver or lymphatic glands, would show the process going on. I have made an extensive investigation into this, and feel confident that the only effect the growth of alien cells has on those of the invaded organ is one of destruction. The normal cells can be seen in every stage of disintegration before the invading growth.

That carcinoma is the local manifestation of a constitutional disease seems to me highly improbable from the manner in which it invariably makes its first appearance in a single organ. The cases recorded of multiple primary carcinoma are very vague in detail, and we must remember that we have no knowledge of how soon cells from the primary growth pass on and establish secondary infection. From cases I have observed it must occur sometimes at a very early stage. From the large percentage of cases in which heredity

has been proved, it seems to me that we must admit an inherited cancerous tendency in certain cells of the body in some individuals, which may be brought into activity by injury or prolonged irritation, or in other cases is excited into action when an organ passes into a condition of senile inactivity. What this inherited tendency is or from what it is derived is impossible to determine, but when we consider the direct transmission of syphilis from parent to child, and the knowledge that we possess of epidemics of this disease existing all over the known world in former ages, it is quite within the limits of possibility that a taint should have been transmitted, which, in its attenuated condition at the present day, might manifest itself in abnormal growth, which after all is what carcinoma really is. Leaving this point for elucidation to those minds having a propensity for abstruse questions, we have to face the fact that to arrest this disease we cannot hope to act on its hereditary nature, but on its local development. We have, therefore, before us the problem that in the three forms of carcinomata are developed three different kinds of neoplasm, and that to arrest them the treatment cannot probably be the same in each case, but the principle, it seems to me, on which we must act is the same. We must find some substance that when introduced into the system will arrest this abnormal cell-growth, either by interfering with the local cause setting it up, or by so acting on these cells as to prevent their further increase.

There is one point in connection with nerve-trunks and nerve-endings which exist in proximity to squamous epitheliomatous growths, but which are not involved in them, that I have never seen noticed,—that is, the change produced in them by a fibrous growth. This is shown by the increased thickness of the perineurium, by a fibrous change in the endoneurium which has destroyed a number of the nerve-fibres, and by a well-marked change in the capsules of Pacinian corpuscles. They have become very much thickened and contracted, giving a peculiar corrugated appearance to these nerve-endings. These changes occur in nerve-structures at some little distance from the neoplasm, but whether this change is brought about by the growth or has any connection with its formation I am unable to say. It is, however, so far as I know, peculiar to squamous epithelioma, as I have often found nerve-trunks passing through glandular carcinoma with their individual nerve-fibres unaltered, and in cancer of the mammary gland I have found perfectly normal Pacinian corpuscles. It may be that an



Nerve-trunks in the vicinity of an epithelioma of the skin; they have undergone a fibrous change; × 130.

epithelioma has the power to affect a nerve-trunk not directly involved in its growth, or it may be that a primary change in the nerve-trunk may affect the part it controls. This is an interesting problem, which may have some bearing on these neoplasms.

Whatever may be the causation, it seems to me that we have to arrest growth in cells, which by their histological appearance and chemical reaction are acting precisely in the same manner as normal cells undergoing germination, but under the influence of an abnormal stimulus.

And I have thought that any substance which would arrest development of normal tissues when introduced into the system ought to act in a similar manner on these cells developing in an abnormal condition. I have been experimenting in this direction for some time, and have obtained results which give me some hope of ultimate success.

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*GASTRECTASIS.**

By L. Wolff, M.D.,† Philadelphia, Pa.

DILATATION of the stomach is known as that condition of the stomach when it is abnormally enlarged and its muscu-

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† Physician to the German Hospital of Philadelphia; Demonstrator of Chemistry, Jefferson Medical College, etc.

lar fibres impaired to an extent that the gastric contents are only slowly or insufficiently propelled through the pyloric orifice. Not all large stomachs are dilated; in fact, there is quite a difference in the capacity of normal stomachs, so that, while some have been stated to have held only two hundred and fifty cubic centimetres, others are said even to hold as much as sixteen hundred cubic centimetres. One can really speak of an abnormally enlarged stomach only when it holds more than the latter amount. Even large and enlarged stomachs may not give rise to pathological digestion, but the dilated stomach, which may be an outcome of the former, always indicates a pathological structural change, and invariably gives rise to a disturbed peptic act.

There are two factors which may be considered as etiological of gastrectasis. Pyloric stenosis is one, and muscular atony of the stomach constitutes the other. In the former, the condition of the obstructed pylorus may be compensated by a muscular development equivalent in propelling power to the obstruction, similar to the compensation in valvular obstructions of the heart. This natural tendency to equalization of impaired function can exist for a limited period only, and must soon give rise to muscular atrophy and genuine dilatation. The causes of stenosis of the pylorus are manifold, and may depend upon mechanical obstruction by external influence, as from floating kidney, pressure, and displacement of the duodenum; or it may result from pathological changes within the stomach, and its pyloric part in consequence of ulceration, inflammation, cicatrization, and neoplasm of either benign or malignant character. Thus polypi may be the cause, as well as an abnormal development of the mucous membrane of the pyloric part of the stomach, and catarrhal hypertrophy may result in the same condition. The dilated stomach may give rise to displacement itself, and with it a partially or totally obstructed duodenum, which cannot be overcome by the already impaired muscular force of the viscus. An increased and abnormal acidity of the gastric juice may besides these give rise to spastic contraction of the pylorus, and though this may not be permanent, it may be followed by true gastrectasis. In the same manner are ulcers, abscesses, and even foreign bodies capable of producing spastic constriction of the pylorus with consequent dilatation.

The gastric ectasis resulting from muscular atony of the stomach, the atonic dilatation of the stomach, may result by muscular exhaustion from over-exertion, or the insufficient nourishment of the muscle consequent on anæmia, chlorosis, and nervous affections. Under this class may be also counted the chronic gastric catarrh and the loss of chemical digestive secretion which is known to form a stimulus for gastric peristalsis. The nervous elements contributing to muscular atony of the stomach are not sufficiently explained, though there seems no doubt a direct relation between a lack of intestinal peristalsis with gastric ectasis. As another cause of gastric dilatation may be mentioned the destruction of the muscular tissue of the stomach by ulcerative processes of some extent, though they may not themselves materially give rise to a loss of tissue, but rather cause cicatrization, with distention of other parts of the stomach.

The anatomical lesions of the muscular coat of the stomach in gastrectasis may present to microscopical inspection a hypertrophic appearance, according to location. Hypertrophy, or what might be called such, from the fact that the muscular tissue is infiltrated with inflammatory products, cancerous material, etc., may be readily defined with the microscope. The same may be said of cicatricial tissue, which may cause hypertrophy in the pyloric portion. Hypertrophy may and frequently does, in persons of advanced age, result in atrophy. Atrophy, however, is more usually found in the cardiac portion, and may be caused by colloid, but more frequently by fatty, degeneration, which increases, together with connective tissue, the interstices between the muscular fibres. The appearance of the mucous coat presents a picture of inflammatory changes, and it may be smoothly disposed or at times even mammillated; there is no marked change in some of the glandular ostia, though the volume of the tubes appear enlarged, and the ovoid cells may be seen in a condition of partial destruction and turbidity, while in some of them they appear to be partly or totally wanting.

Gastric dilatation is more apt to be met with in middle-aged people than in the young, though it has been reported in the young and even in children. The development of this condition is always more or less gradual, and on account of the prevailing symptoms it is in the beginning generally considered as simple dyspepsia, attributable to errors in diet or nervous causes. To the general symptoms of anorexia, epigastric pressure and fulness, ab-

dominal distention, buccal fetor, supraorbital headaches, and irregularity of the bowels, there is to be added, as a characteristic feature of extreme dilatation, the vomiting, which occurs at intervals, when by superadded ingesta and the fermentative changes they are undergoing the distended stomach becomes irritated and reflex vomiting takes place. This may occur in periods of several days only, or may be even more protracted where total paralysis of muscular structure has ensued. There is one unmistakable feature of the vomiting of gastrectasis, and that is the enormous quantities which are ejected at one time, the comparative ease with which the emetic act takes place, and the character of the ejecta, which are composed of the food particles of several of the meals previously ingested, together with the fermented appearance it presents and the gases arising therefrom on standing. The microscopic examination of the vomited matters reveals the presence of yeast fungi and other cocci and bacteria of decomposition, together with sarcinæ ventriculi, which at one time were considered so important, but have now no prognostic or diagnostic value.

The chemistry of the functional dilatation is, in cases where marked chronic catarrhal symptoms are absent, a normal one, or rather perhaps one of subacidity; in complete dilatation from pyloric stenosis, it is held by such eminent workers as Ewald and Riegel that in all cases non-cancerous they had found HCl, though in a diminished amount. I have not been able to confirm their statements, as in the case which I will present to you to-night the gastrectasis which resulted from complete pyloric stenosis was during the whole time of treatment accompanied with anacidity, and the patient, though apparently cured of his stenosis and improved in dilatation, presents yet the picture of total anacidity. The second case which I will present to you to-night of a functional dilatation, with chronic gastric catarrh, has shown from the beginning of treatment total anacidity, and acidity is returning gradually as result of treatment. The gastric distention in a dilated stomach is still further increased by the changes of decomposition, which give rise to gases of various kinds, such as CO_2, H, CH_4, H_2S, etc., which are only slowly regurgitated through the œsophagus; the patients, besides, are troubled with pyrosis, from the presence of acetic, butyric, and lactic acids. This formation of organic acids and their by-products of gases are due to the lack of HCl in the dilated stomach. It is claimed that the irritant effects upon the gastric mucosa gives rise to another great symptom of gastrectasis, which is impaired absorption. The tests, hereinafter to be mentioned, with salol and KI, confirm this in an apparently clear manner, which, however, depends as much on a loss of muscular propulsion as on the chemical irritation. The patients suffering from high-graded dilatation soon manifest marked inanition, and while in such cases the vomiting becomes less frequent, the fetor of the eructations becomes more marked. The nearlying viscera are displaced, fæcal discharges are more retarded, and dyspnœa and cardiac palpitation increase in a measure that the diaphragm is pressed upward by the distended stomach. Intestinal absorption is also diminished, causing dryness of skin and flabbiness of muscles, owing to the want of water of these organs. Nervous phenomena go hand-in-hand with this from the same cause, resulting often in coma, convulsion, and cardiac impairment. All these symptoms have been ascribed to the presence of ptomaïnes, poisonous gases, and by Litton to aceton; but it it is not apparent that, with a claimed lack of absorptive power, such auto-intoxication could be probable, and, in fact, Frederick Mueller has examined the contents of stomachs under such conditions for ptomaïnes without results.

The diagnosis of gastric dilatation is not always easily effected in its early stages; the ordinary symptoms of dyspepsia are more evident than the deeper-lying etiological factor. Before the characteristic vomiting takes place, medical examination will not always be directed to the employment of physical diagnostic measures. When this is done, inspection may lead, in the case of thin and pliable abdominal parietes, to reveal a protruding hemisphere, if the stomach is distended with gases or liquids, extending from beneath the ribs from the left to the right hypochondriac region; its lower segment extends to the line of the umbilicus, or any portion below this towards the symphysis pubis. The curve may be altered in various ways, according to the position of the ingesta; gastric peristalsis may become sometimes apparent under such conditions. The inspection may become facilitated by the employment of inflation of the stomach, which is best effected by an ordinary atomizer-bulb through a stomach-tube, more so than with the much-vaunted method of inflation by means of mixtures which generate CO_2 in the stomach. Further inspection in advanced gastrectasis reveals the ab-

dominal parietes somewhat flabby and sunken over the empty viscus, the false ribs of the left side appear lifted up, and the skin is dry, pale, and of cachectic appearance.

Palpation of the epigastrium in the simple form of gastric dilatation will be of little aid in regard to the distended viscus, but may be said to be of the greatest value in the determination of the causes which lead to it. As I have already stated, complete gastrectasis is almost invariably, if not altogether, the consequence of pyloric disease and obstruction. This latter is capable of being discovered by palpation alone. Thus carcinomatous and other tumors can be detected on the right side of the epigastric region, and floating kidney, or even pyloric hypertrophy may so be ascertained.

The employment of percussion will be the first step to make the presence of dilatation more certain, if properly conducted ; thus the lower contour of the stomach may be with accuracy determined. If a stomach before inflation contains some fluid, or if the patient has been directed before inflating to take a glass of water, and he is thereupon examined in an erect position, the dulness of the water-line will be readily detected by percussion from above, while the lower segment of the fluid can be readily ascertained by the dulness which distinguishes it from the resonance of the colon from below. It may be necessary, however, for this latter purpose to inflate the colon, if it is not already tympanitic. Tumescence of the pyloric region may also be indicated by dulness of that part of the organ.

Auscultation may be used to advantage in gastrectasis, if combined with a tube and inflation in a stomach containing fluids. I have relied upon this method largely for determining the lower segment and extent of the distention. To this end I employ an ordinary small stomach-tube, having previously ascertained that the stomach was empty, or, if not so, having washed it out, I direct the patient to take a glass of water. If, now, the stomach is inflated while the ear is applied to the epigastrium, the point of greatest intensity of the bubbling sound of the air escaping through the small quantity of water contained in the stomach will accurately determine the lowest part of the stomach. In patients with thin abdominal parietes this will besides become readily apparent to palpation. The swallowing sounds, or "Schluck Geräusche," so important at times in the study of cardiac constriction, are of little, if any, importance in the study of gastric dilatation.

The chemical diagnosis of gastrectasis may be twofold,—first, as to the propulsive power of the stomach. As already stated, the power of the stomach to rid itself of its contents through the pylorus depends largely, besides the lumen of the latter, on the action of its muscular coat. With atony and paresis of the latter this is retarded, and in complete pyloric stenosis entirely abolished. This has been ascertained with great ingenuity by the administration of salol, which is a compound ether of phenyl and salicylic acid radical, and in the alkaline intestinal contents readily splits up into phenol and salicylic acid, the latter of which promptly appears in the urine as salicyluric acid, easily recognized therein on the addition of neutral ferric chloride, which turns it to a rosy-red color. Experiments have proven that salol is not directly absorbed by the stomach, and that its decomposition is probably brought about by the pancreatic secretion. Under normal conditions, the presence of salicyluric acid in the urine may be demonstrated within forty to seventy-five minutes after the ingestion of salol. Any period longer than that may be attributed to a paretic condition of the muscular coat of the stomach.

The chemical examination of the gastric secretion will indicate the pathological condition of the digestive function arising from dilatation, rather than give an idea of an existing ectasis. It must be said, however, that the determination of a faulty digestive secretion is, perhaps, the first step that leads us to suspect structural changes. I may say that, while I have examined numerous instances of gastrectasis in which I found HCl present, the quantity in each one of these was below normal, while in the older and graver cases I have never discovered any HCl. The pathological changes in the mucous coat, showing a partial and often total destruction of the ovoid cells within the ostia of the peptic glands, and our knowledge of the origin of this acid from these cells, would point to the impossibility of HCl secretion in old and extensive cases of dilated stomach, contrary to the opinions and writings of some who claim that such is and can be the case.

I have dwelt in several previous papers* on the subject regarding the technique of the

* "Recent Advances in the Diagnosis and Treatment of some Diseases of the Stomach," by L. Wolff, M.D. (*Medical News*, September 21, 1889); "Chemistry of Gastric Digestion," by L. Wolff, M.D. (*Transactions of the Philadelphia County Medical Society*, October 9, 1889).

chemical examination of the gastric secretion, and will, therefore, omit it here. I will state, however, that in numerous examinations of the secretion of dilated stomachs, in all stages, I have never failed to find the presence of pepsin, as shown by its digestive power on coagulated albumen when acidulated with HCl.

As further physical means of determining the presence and extent of gastric dilatation, should be mentioned the complete filling of the stomach with water through a tube, and then siphoning out and measuring the water it contained. Any stomach found to hold more than two thousand cubic centimetres, or two litres, may be safely regarded, then, as dilated.

The prognosis of gastrectasis must vary with the causes of the dilatation; as a distended stomach itself is not a condition that would seriously impair health and life, the consequences rather than the structural change have to be taken into consideration. Dyspepsia and apepsia exercise, if not corrected, such pernicious influence on health that through malassimilation they may produce inanition, and thus prematurely end life. The degree of these is, however, conditioned by the structural changes that take place at the pyloric orifice. If these are malignant, the fatality of the disease is obvious, unless interfered with surgically. This is also the case with polypi of the pylorus and cicatricial stenosis; in this latter instance, however, the prognosis as to life is more favorable, not alone through the better results obtained with such cases by surgical procedure, but also by the removal of the hyperæmia, which may be obtained by relieving the gastric mucous membrane of the irritation by the pathological digestive act. Most favorable are the atonic cases of recent distention, owing to continued errors of diet and excessive eating and drinking. In these cases, which we may term for convenience paretic ectasis of the stomach, good results will probably always follow proper treatment. As much cannot be said of cases where the distention is complete and the muscular fibres are in a state of paralysis. Under such circumstances, which are characterized by continued absence of HCl from the stomach, much can be done to relieve the distress consequent thereupon, together with the dyspeptic symptoms, and a lack of the proper elaboration of chymus in the intestines, and the malassimilation depending upon it. Little is to be hoped for reducing the viscus to its normal dimensions or establishing in such stomachs a proper chemical digestive act. Such patients, however, may be kept for years in a comfortable condition by observing a proper regimen or avoiding errors in diet. It is true that, sooner or later, the dilatation may give rise to conditions which are not easily overcome by palliative treatment, and for which, then, the surgeon's knife might hold out the only hopes for improvement. Since we know, however, that persons with gastric ectasis, and an absence of proper HCl secretion, may be able to live comfortably, and, under proper precautions, may certainly gain weight, such interference, when malignancy can possibly be excluded, should not expose patients to the risks of an operation until other measures have been exhausted.

The treatment should be directed, first of all, to relieve the symptoms of indigestion, the vomiting resulting therefrom, and the establishing of a proper peptic function. To this end it is obvious that emptying of the contents of the stomach, and the removal therefrom of the accumulated mucus, together with the causative elements of fermentation, are of prime importance. While emesis, so characteristic of this affection, will probably meet the first contingency, that of rendering the stomach aseptic can be accomplished only by lavage. To this end the stomach-tube should be employed daily, or even twice in that period; the quantity of liquid to be employed depends on the condition supervening, but should not be suspended until the washings return perfectly clear. Where the catarrhal condition gives rise to the presence of viscid mucus, it is necessary to add to the water a drachm or two of sodium bicarbonate; where the rank odor of butyric and acetic acids indicate the presence of organized ferments, additions of similar quantities of either sodium salicylate or sodium borate should be made. The time best suited for washing out the stomach is before the principal meal of the day, and may proceed this best by a half-hour. One of the most important features of the treatment next to this must always be the dietary regimen. Food substances which are slowly digested should be carefully avoided, as well as those which are prone to fermentation. It has been held that a dry diet should be the principal feature of such dietetic treatment, but I differ in this respect. *A priori*, it appears to meet the indications; but when we consider that dry foods are not readily acted on by the peptic secretions, and that the stomach is certainly still capable of directly absorbing some liquids

and liquid foods, the precaution appears superfluous, and it has proven of no advantage in my experience. Milk diet, so freely and promiscuously ordered in all digestive troubles, is probably the most objectionable in this affection. Scraped meat on toast, white meats of fowl, stewed mutton, or boiled beef answer to excellent advantage when followed by 15 to 20 drops of HCl, diluted in a wineglass of water. Toast in limited quantities is more readily digested than ordinary bread, while succulent vegetables are permissible. One of the principal articles of diet is ordinary beef or mutton broth, to which, before being served, one or two raw eggs have been added and well beaten up. Of stimulants, nothing but dry white wines or clarets should be allowed at meals; pastry, puddings, and sweets must be, of course, studiously avoided. Such diet, however, may be suited for comparatively mild cases only. The graver cases, accompanied with almost complete apepsia, will be best maintained, per os, by the abovementioned broths, with eggs, followed by HCl, while superadded to these must be rectal alimentation. As in such cases the bowels are always torpid, this measure is quite feasible, and may be continued for a considerable period. Nothing will so benefit such patients as nutritive enemata properly made and administered. It appears to me a mistake to exhibit as such any food in a soluble condition without being predigested. The lower bowel certainly secretes no digestive ferments to change food to an assimilable condition, whereas its absorptive power is well known. For this reason only such food should be exhibited per rectum that may be directly absorbed. I have been in the habit of using from two to four ounces of pure glucose dissolved in starch mucilage, or even milk, as vehicle, three to four times daily, adding thereto one ounce of beef peptone, and stimulants if required. By such a course of rectal alimentation I have seen patients rapidly increase in weight and strength, and I have in my mind a case with complete pyloric stenosis who was carried to the hospital weighing eighty-nine pounds, and in three months thereafter left with a weight of one hundred and fifteen pounds, which subsequently increased to one hundred and forty-six pounds. I need scarcely mention that during rectal alimentation the bowels should be daily washed out with large enemata of lukewarm water.

I have already referred to the constipation supervening in such cases, and in order to obtain rapid absorption of food free alvine discharges must be procured. As we have to depend with such cases largely upon direct gastric absorption, the salines seem to be alone eligible for the purpose; the Carlsbad salts or sulphate of sodium dissolved in hot water, taken directly after lavage, may be preferably employed to that end. Medication seems but little indicated. Besides the HCl given freely after the albuminous food to make up for the lack of acidity necessary to form peptones, and pepsin always being present, there is but one remedy upon which we can rely to produce contractility of the muscular fibres, and that is strychnine. Its tonic properties in such cases cannot be too highly praised, while of the other remedy recommended in such cases—the condurango—I cannot say as much from my own experience.

As I have already stated, in the older and severer cases little is to be hoped from any means for establishing a smaller lumen of the viscus, or a return of the acid secretion of its glands; this at times may certainly be accomplished by the treatment employed with that view. The two measures to be relied upon for that purpose are massage and the faradic current. While the former appeals to the fashion of the period, and no doubt promotes a healthy nutritive circulation, the internal faradization of the stomach is the most rational and serviceable of the two. External bipolar faradization, practised and extolled by some, will probably accomplish just as much or as little as massage. Why it should be employed when internal faradization is so easily and safely accomplished, and with such excellent results, is to be wondered at. The stomach electrode employed by me consists of a small nickel-plated brass olive screwed on to a flexible copper wire about one yard in length, and insulated by being covered with rubber; it is easily introduced, either by the patient himself or the medical attendant. Before introducing the electrode, the patient should be directed to take one or two glasses of water. The current itself should be feeble at the beginning, and gradually increased until peristaltic movements are experienced by the patient, which may be even felt at times by the attendant through the external parietes.

As an illustration of what may be accomplished in cases of gastrectasis, I will now bring before you this patient:

R. M., aged 37, was born in Ireland, and is a stoker by occupation. He has been suffer-

ing from dyspepsia for about three years, for which he sought relief in various quarters. He came under my care about three months ago, complaining of epigastric fulness, anorexia, eructations, frontal headaches, furred tongue, buccal fetor, together with marked nervous symptoms, consisting of insomnia, melancholia, hallucinations of persecution, and has lost greatly in flesh.

Chemical examination of the gastric secretion revealed anacidity after trial meal, and on washing out the stomach large quantities of viscid mucus having an acrid odor were removed. Physical examination proved all organs, excepting stomach, to be normal. Inspection of stomach showed great distention, and auscultation of the inflated viscus revealed the lower segment about three inches below umbilicus. Siphoning out proved capacity of stomach about six litres. He states that during the time he is at work he drinks large quantities (gallons) of water. There was no tumescence or tenderness in pyloric region; no history of hæmatemesis and no cachexia. Diagnosis: atonic gastrectasis, with chronic gastric catarrh. Ordered suitable regimen, followed by HCl, also $\frac{1}{24}$ grain of strychnine t. d., daily lavage before principal meal, Carlsbad salt to be taken in morning while fasting, and internal gastric faradization, together with abstinence from excessive potations.

I will now extract some of the gastric secretions, and you will see that they give a decided HCl reaction. On inflation you will find the lower segment of the stomach one inch above the umbilicus, and when I measure the contents of the full stomach, which I have siphoned out before you, I find it to be about three litres. You hear from the patient that his appetite is good, that he sleeps well, and, though still inclined to melancholia, he is so in a much less degree than formerly, also that he has gained in weight and strength.

DISEASES OF THE LUNGS AND HEART: THEIR DIAGNOSIS AND TREATMENT.

By William B. Canfield, A.M., M.D.*

AN article on the treatment of certain diseases in which nothing new or startling is offered may, at first sight, seem of no value; but when it is considered that a large experience in treating a certain class of cases must of necessity separate the effective from the non-effective treatment, it is hoped that the recording of such experience may be of some value.

In treating diseases of the lungs and heart, in hospital and in private practice, the physician unconsciously divides his cases into two classes,—the rare and the more common ones; and in treating these cases his extended experience both in diagnosis and treatment often gives him the ability to select the proper remedy with the best results.

In an experience of about five years at the Chest Clinic of the University Dispensary, in other public institutions, and also in private practice, I have seen many thousand cases of lung- and heart-disease, and, without the hope of making phenomenal observations, I wish to record the general line of treatment found to be most effective.

The most usual complaints made by a patient with a cough are cough, pain or constriction over the chest, difficulty of breathing, and shortness of breath. After a short history of these more prominent symptoms are noted, the length of time he has been sick, what the present complaint is, what made him seek a doctor, etc., a careful physical examination is made. Although the patient's own description of his complaint is often of little or no value in making a diagnosis, still the endeavor always is to find out what was the symptom that led him to seek medical advice. Most patients who cough, naturally refer the cough to the lungs, and it is not very usual for a patient to apply for treatment complaining of trouble over the heart, with the result of finding a heart-disease. Many of the cardiac murmurs are either discovered in the general examination, or are suspected by the pulse, general appearance, etc., and are rarely suggested by the patient's own history. A physical examination of the heart and lungs very often reveals nothing; in fact, patients who have been complaining for two or three days only, with a previous history of having been entirely well, are sometimes passed over without an examination in a large dispensary practice, or the examination is deferred to a later visit.

It is often surprising how theory and practice differ. Works on auscultation and percussion, and instructors, too, tell us in making a diagnosis never to be satisfied with an examination through the clothes, but to get as near the skin as possible. The young man who has just returned from the German hos-

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pitals, where implicit obedience with almost military precision prevails, who comes home with the idea of percussing, auscultating, and palpating the naked surface of each patient, soon learns the impracticability of this plan. Notwithstanding, teachers and writers to the contrary, there arise numberless cases where we are obliged, through feelings of delicacy, tact, etc., to examine our patients through thick clothing, corsets, etc., and it is just as well to train the ear to these adventitious sounds as it is to learn the normal and abnormal physical signs. Many a would-be applicant dreads a life insurance examination, and it is the careful, kind, and tactful examiner who knows how to do his work to the best interests of the company and the timid applicant.

DISEASES OF THE LUNGS.

Acute Bronchitis.—In the spring and autumn, and especially during epidemics like the recent visitation of influenza, cases of acute bronchitis are very common, and generally after a sudden change in the weather patients from different parts of the city come complaining of about the same symptoms, which seem to have appeared about the same time and evidently due to the same cause. Such cases usually recover under the use of some simple expectorant mixture. A favorite one with me has been the following:

℞ Ammon. muriat., ℥ss;
Mist. glycyrrhiz. comp., ℥iv. M.
Sig.—Take a dessertspoonful every three or four hours.

The dose is smaller in the extremes of life, and in severe coughs it is given every three hours, or even more frequently. This has become a very successful remedy in the large majority of cases of acute bronchitis of short duration and slight physical signs, and, in fact, all lung coughs seem to be improved by it. In a few cases it causes constipation, and then something else must be substituted, as some of the syrups, etc.

Scientific pharmacy has improved so markedly the preparation of drugs, that nauseous and bad-tasting mixtures are rarely prescribed by the physician, who is anxious to please the patient and make a reputation. Instead of liquid medicines, small capsules and tablet triturates have been found very convenient. Tablets of the muriate of ammonium and the compound licorice mixture are very efficient. When the secretions are with difficulty brought up, the use of senega is advised. The syrups are usually so sweet that in adult practice I often prescribe the fluid extracts, using mucilage of acacia or glycerin instead of water. Of course, in a dispensary practice, inhalations and external applications may be ordered, but they are rarely carried out. In private practice, a case of bronchitis usually does better in a room in which there is moisture, as steam from a kettle. Besides the internal medication, counter-irritation with Stokes's liniment, mustard, iodine, poultices, etc., form an important part of the treatment, and when there is a laryngitis with the bronchitis, inhalations of the compound tincture of benzoin, or oil of turpentine, poured on steaming water, give great relief.

When the secretions are abundant and not easily coughed up, I find turpentine in emulsion an excellent remedy, not so pleasant, perhaps, as terebene or terpine hydrate, but rarely failing to do good in properly-selected cases. The formula, with occasional modifications to suit particular cases, is:

℞ Ol. terebinthin., ʒii to ʒiii;
Mucil. acaciæ, q.s.;
Aq. cinnamomi, ℥i;
Aquæ, q.s. ad ℥vi. M.
Sig.—A tablespoonful in a little water every four hours.

Ofttimes the cough is of such an irritating character that these ordinary expectorant mixtures avail little; then recourse must be made to a narcotic in some form. Morphine, of course, is a powerful remedy, but it has serious objections, not the least of which is the tendency to form the habit. Codeine, a very useful alkaloid of opium, has the advantage of not constipating as much as morphine, and the codeine habit is not apt to be formed, as patients rarely recognize it as belonging to the opium family. This, united with the wild-cherry bark in some form, will stop an irritating cough, or, at least, prevent those frequent spasms of coughing. The virtues of the wild-cherry bark depend on the hydrocyanic acid in it, which acts on the pneumogastric nerve. A good combination is:

℞ Codeinæ sulphat., gr. viii;
Syr. prun. Virginian., ℥ii. M.
Sig.—A teaspoonful in a little water three or four times a day, and at bedtime if necessary.

Of course, where the secretions are abundant, such narcotics do harm, but in the dry, irritating cough of nervous origin,—a cough that prevents sleep,—such a prescription is necessary.

Capillary Bronchitis in the adult is a very discouraging disease to treat, and too often proves fatal. The diagnosis is not always easy. It has been mistaken for pneumonia and pleurisy. The intense anxiety and dyspnœa of the patient is very startling to the nurse. The most important step is to keep the room filled with steam from a kettle, and use frequent inhalations of benzoin or turpentine. The great difficulty is to dislodge the tenacious mucus from the lungs. Expectorants do little and stimulants do much. In fact, in this disease you must pin your faith to constant stimulation and nourishment. We must also sacrifice elegant pharmacy and give nauseating remedies. Nauseating expectorants cause vomiting, which removes the bronchial secretion. The external use of mustard, Stokes's liniment, and large poultices is of the utmost importance. Even after the use of all these means, the patient, apparently strong at the beginning, will succumb to the disease.

Chronic Bronchitis, both alone and combined with *asthma*, can never be cured. Such cases return for treatment quite frequently, and it is only by palliation of the more acute symptoms that the patient can be kept in comfort. Spasmodic asthma is another disease that requires continual watching. In this class of chronic and incurable troubles I find the iodide of potassium an unpleasant but potent remedy. An attack of asthma often does well under the following:

℞ Potass. iodid., gr. lxxx;
Potass. bromid., ʒiii;
Aquæ, ℥iv. M.

Sig. —A dessertspoonful in a little water three or four times a day.

When the disease is a chronic bronchitis, whether with or without emphysema, I give the iodide of potassium in the following mixture:

℞ Ammon. muriat., ʒss;
Mist. glycyrrhiz. comp., ℥iv;
M., et adde
Potass. iodid., gr. lxxx. M.

Sig.—A dessertspoonful in a little water three or four times a day after meals.

This is an extremely disagreeable mixture, but patients will generally put up with it for the good it does them. The results with the nitrite of sodium, as suggested by Dr. Fraser, for use in chronic bronchitis, with and without emphysema, were not satisfactory. In some cases good was done, but in most cases not. In treating these chronic diseases the value of tonics should never be lost sight of. Fowler's solution of arsenic is an excellent remedy in these cases, as also is the occasional use of iron. It should never be forgotten in these cases to keep the portal system relieved of congestion by moving the bowels freely.

Pulmonary Consumption.—The reason that more cases of consumption are not cured is often because they are not recognized early enough. Whenever cures of consumption are reported, we should not forget that cases recover spontaneously. There can be no doubt in any one's mind but that prevention is better than cure. Unfortunately, in pulmonary consumption the physician is generally called in too late even to hope to effect a cure. Up to within a few years ago, consumption, when detected, was considered absolutely hopeless, and the physician's only duty was to try to alleviate the accompanying suffering and produce painless euthanasia. This plan of treatment was followed because the disease was recognized at too late a stage.

Although the judicious use of auscultation and percussion, and, in fact, of what is called physical diagnosis in general, has done so much towards mapping out with comparative accuracy the locality and extent of the lung lesion, still, even before these methods were used, the keen observer, by other signs and symptoms, often suspected the fatal disease at a time when the most skilful diagnostician could have found no physical signs of it. Now that that newer department of medicine, bacteriology, which too many consider impractical and as belonging to the pathological laboratory, has given us a more certain evidence of the early approach of consumption, we need rarely be in doubt. Ever since the discovery of the bacillus tuberculosis by Koch, few or no important observers will deny its causative relation to tuberculosis in general and pulmonary consumption in particular. The discovery by Koch has given us one solid fact. If we find the tubercle bacilli in the sputum, consumption is present; and if, after a sufficient number of examinations, the bacillus is not found, then we may conclude that we are not dealing with consumption.

Most cases of consumption that I have treated have died, but some have undoubtedly recovered, and on these I have based principally my line of treatment. Long before the first physical signs can be detected, bacilli have been discovered in the sputum.

As soon as the history of the case gives the slightest hint of a tuberculous history, I examine the sputum repeatedly, and if the bacilli are present, the case is attacked vigorously. The presence of elastic tissue in the expectoration is a very important diagnostic aid, and should not be overlooked in the search for bacilli. It may occur in other troubles than tubercular phthisis, but the continued presence of this tissue points strongly to this disease.

My plan is, first, to take the temperature at least twice a day. As long as there is fever the disease is progressing. I also have the patient's weight taken, and examine the urine for albumen. If there is fever, it is treated by absolute rest and an antipyretic, preferably acetanilide. If there is no fever, and little or no loss of weight, I try, by a carefully-selected diet, to keep up the appetite, and at the same time, where possible, I give cod-liver oil in emulsion or morrhuol, the latter an excellent substitute in warm weather for cod-liver oil. A pleasant combination is:

℞ Tinct. cardamom. comp., ℥ii;
Tinct. gent. comp., ℥iv;
Emuls. ol. morrhuæ, ℥xi. M.
Sig.—Dose, a tablespoonful.

If the cough gives trouble, it is best to try to quiet it, particularly at night, for the patient's rest is very important. If possible, avoid opiates, for while they lessen cough, they prevent the secretion already formed in the lungs from being expectorated. The least objectionable of the opium class is codeine. The following is not unpleasant and very efficacious:

℞ Codeinæ sulphat., gr. viii;
Acid. hydrocyanic. dilut., gtt. xx;
Syr. prun. Virginian., q.s. ad ℥ii. M.
Sig.—Take a teaspoonful every three hours, and in the night if necessary.

This does not constipate, and at the same time checks the tickling cough. Beechwood creosote has been highly extolled as a remedy for pulmonary consumption. It does do a great deal of good, but it is doubtful if its effect is antibacillary. I have used it to a limited degree, and the results have been encouraging. It may be administered in liquid form, with lime-water, with whiskey and glycerin, or in the form of capsules. I have also been much pleased with guaiacol, a remedy allied to creosote, and very palatable when taken with sherry wine. The combination I use often is creosote, spirit of chloroform, and alcohol, both internally and as a vapor to be inhaled on steaming water. If it is not an antibacillary remedy, it has a very soothing influence on the cough and the inhalations have the advantage of not nauseating the usually delicate stomach of the consumptive. Koch's inoculation treatment I have only used in a few cases of incipient phthisis, and in my zeal to benefit these patients I put them on a special diet and the guaiacol mixture, in addition to the hypodermic injections of tuberculin, so that their improvement may have been due to the combined treatment, and Koch's method could not take all the credit.

In the use of these methods I have been able to cure some cases,—that is, they have lived for several years without signs of the disease. It is probable that in these cases, the cavities becoming encapsuled by fibrous tissue, the tubercular action is cut off.

Cases that are doomed from the beginning require the utmost tact and skill in their management. Such cases are very discouraging. It has happened to me, as it has to many others, to utterly fail to benefit such cases, with the result of being dismissed, only to be recalled as the end approached. If a case is destined to die, it is the physician's duty to alleviate every unpleasant symptom at any cost whatever. Fortunately, such patients are cheerful and hopeful to the end. When the patient has no scruples against it, and often when he has, alcoholics should be used freely, for no danger of a habit is incurred. At the end a strong solution of cocaine (four to eight per cent.) sprayed in the throat, just before eating, may assist the swallowing, but this is staving off death by a very few days or hours only. The following is an excellent prescription when the cough is harassing:

℞ Morph. sulph., gr. ii;
Acid. hydrocyanic. dil., gtt. xvi;
Ol. cubeb., gtt. xii;
Syr. tolu, ℥ii. M.
Sig.—A teaspoonful at a dose.

The morphine in this prescription may be increased indefinitely, as such patients in the last stages soon become accustomed to it.

The gastric disturbances of phthisis are sometimes so marked, also the pharyngeal catarrh, that they may at first sight mask the real disease. Such cases come to us complaining of catarrh or dyspepsia (usually both). As long as the deception is justifiable, it is well to call the disease by these names. It is very likely that the continued swallowing

of tuberculous sputum affects the gastric juice secretion.

I have had occasional cases of what was apparently phthisis caused by the inhalation of dust. In one case I found bacilli in abundance, but the man gave up his occupation of miner and recovered, the bacilli entirely disappearing. In the sputum of all these cases the phagocytes could be seen, some of them fairly bursting with coal or other mineral dust. Such cases, while not originally tubercular, become so by the entrance of the bacilli into the alveolar walls wounded by the sharp edges of the crystalline dust particles. The tendency is to recover after the patient is removed from the influence of this irritating dust.

In spite of all newer methods of treatment, the best results are undoubtedly obtained by climatic treatment, properly conducted under medical supervision, if taken at the very beginning. G. Cornet* has recently published some inoculation experiments with tubercle bacilli in guinea-pigs. He inoculated twelve guinea-pigs with tuberculous matter; kept six confined in Berlin, and sent six to Davos, and all died alike. Such experiments are misleading. In regard to tubercle bacilli: in most of the cures vaunted by foreign (German) writers, improvement was gauged by the diminution in the number of bacilli found, and the reverse. This hardly seems to be the proper test. Although we cannot help recognizing the diagnostic importance of these bacilli, still we should keep in mind the lung or laryngeal lesion, the general health, appetite of the patient, as a key to this improvement. I have repeatedly observed, as many others have, that patients in whom there was absolutely no signs or symptoms of phthisis, as obtained by ordinary means, had their sputa laden with bacilli; while, again, in well-marked cases, not too far advanced, the bacilli were only to be found after many examinations. Again, as we should naturally suppose, laryngeal phthisis, even at its very incipiency, shows a much larger number of bacilli in the microscopic field than lung phthisis. From this we see the importance of the microscope in the diagnosis of the early stage of phthisis. Dr. G. Hunter Mackenzie† says that the number of bacilli found in the sputum of any case does not seem to bear any reference to the severity of the case. One case may apparently improve, and yet bacilli in large numbers be found, or another case may grow worse, and the bacilli be very scanty. In the latter case the spores, which are very tenacious of life, remain.

The fact that pulmonary consumption may undergo spontaneous cure should be remembered. Those who have seen and made large numbers of autopsies will remember having seen evidences of an old tuberculous disease, long since cured, a lung with signs of a healed cavity or with an old cicatrix. Vibert‡ found in the Paris morgue, in one hundred and thirty-one persons between the ages of 20 and 55, all of whom had died violent or sudden deaths, that evidence of phthisis existed in twenty-five, and in seventeen of these (sixty-eight per cent.) it was cured. These facts should be borne in mind by those who report cures from new remedies, basing their deductions on a few cases.

DISEASES OF THE HEART.

Cases of heart-disease are by no means so common as lung-disease, and yet it is surprising how often a serious valvular trouble will be discovered without the least suspicion on the part of the individual. Many of such cases complain principally of shortness of breath and occasionally cough.

The *functional* heart-troubles are, as a rule, not as severe, and they generally attract the patient's attention to that organ. Palpitation is a well-known symptom. It may come from an overloaded stomach, shock or excitement may cause irregularity of action, but whatever the trouble, the removal of the cause generally results in a cure.

The excessive use of tobacco causes violent palpitation and irregularity of action in some persons, and gives what is called the "irritable heart." Such cases, if not too far advanced, improve under lessening of the amount of tobacco and combined with the use of the bromides in large doses, and occasionally digitalis to regulate the heart's action. As it is inexpedient to withdraw tobacco entirely from an inveterate smoker or chewer, it is much better to lessen the amount gradually, and give directions as to smoking. For example, it is better to smoke on a full stomach, and cigars are often preferable to a pipe or to chewing. The pipe is objectionable because the stem so quickly collects the poisonous element of the tobacco, which is thus drawn into the lungs in a concentrated form. Smokers are always advised to clean their

* *Centralblatt f. Klin. Medicin*, No. 14, April 6, 1889.
† *Edinburgh Medical Journal*, January, 1889.
‡ *Lancet*, 1888, ii. 598.

pipe-stems frequently, and chewers are apt to swallow saliva mixed with tobacco. Such cases are constantly returning for treatment, any amelioration leading to a return of the excessive smoking, until the heart is permanently disabled.

Organic disease of the heart is recognized principally by the valvular murmurs, but the other symptoms or signs of valvular lesion should never be lost sight of. A valvular murmur is a very important diagnostic aid, but its importance should never be exaggerated, nor should a diagnosis of heart-trouble be decidedly made at the first examination, for it is no uncommon experience to find the patient's excitement attendant upon the first examination cause a murmur which is absent at future examinations, or the forcible beat of the excited heart may simulate a short murmur. Murmurs due to anæmia disappear with the use of iron.

The most common valvular lesion is mitral regurgitation, and it is especially common in persons under 30 or 35. The aortic valve is most commonly affected in persons over 45. At the latter valve occur the most serious troubles, while at the mitral the least serious are found. Of course, the regurgitant murmurs are the worst, causing congestion and dropsy, general or local. The pulse is a very important and often neglected indication to the effect of the valvular lesion. Much more could be learned from a careful study of the pulse in these diseases than usually is done.

In the treatment of these troubles there is not so much scope as in diseases of the lungs. In spite of the various substitutes and newer remedies, nothing seems to take the place of digitalis, and even strophanthus, which has just claims for excellence, occupies a second place. In spite of text-books and many authorities to the contrary, digitalis seems to do good in all the valvular troubles. It not only strengthens the systole and prolongs the diastole, but it serves to regulate the heart. Theoretically, it is contraindicated when practically it does much good. When there is no anasarca or ascites, and the symptoms of distress are not very severe, the tincture of digitalis is used in 10-drop doses in water three times daily. If the case is anæmic, and it often is, the digitalis may be alternated or combined with iron, or with iron and strychnine. If there is much anasarca or ascites, or both, and the stomach is not too sensitive, a tablespoonful of the infusion of digitalis is given three times a day, and compound jalap powder, ʒss to ʒi, morning and night, is given for several days.

Some persons would not be able to bear the knowledge that they had heart-disease, while others have the good sense that will give them the care to live out their natural lives, in spite of the knowledge of their incurable disease. When possible, the patient should be informed of the trouble, its dangers, the care necessary in daily life, and what to do in an emergency.

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*SOME CLINICAL EXPERIENCES WITH EUCALYPTOL.**

By I. N. Brainerd, M.D., Alma, Mich.

DURING the last ten years I have often prescribed eucalyptol in bronchial and pulmonary troubles. From this experience I have learned to put a high therapeutic value upon it in some respiratory affections,—viz., chronic bronchitis, chronic interstitial pneumonia, persistent cough, and to a less degree in tuberculosis.

The following list of cases, taken from my later experiences, furnishes a reasonable amount of proof of its utility.

Case I.—Miss B., aged 19. This lady called upon me in August, 1888. She complained of malaise, and some pain in her left lung. She had only a moderate cough and a limited expectoration. Her temperature was 99°. Auscultation revealed a harsh and catchy respiration in the upper lobe of the left lung. A trifling dulness could be discovered on percussion in this region. I gave this girl eucalyptol, and had her visit my office every two weeks for half a year. She so far improved as to lend expectation to her recovery. Then, school beginning, she started to school. As cold weather came on, she was chilled one day in school, and developed a severe croupous pneumonia. For this she was treated by a physician in her town; but not recovering, I was called to see her. Resolution did not take place as it should, and I advised the mother that the girl would never recover from this sickness. After a few weeks she died. I believe that, except for this intercurrent pneumonia, this girl would have continued to progress to a recovery from her phthisis. For a whole year she improved

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until she felt nearly as well and strong as ever. Then she sickened with pneumonia, and died in two months.

CASE II.—Mrs. T., aged 30. This lady called upon me in September, 1889. She was emaciated to a skeleton, had hectic fever, pulse about 90, cough with some expectoration, and tenderness on percussion over both lungs. The respiration was catchy and frequent. She had almost a loathing for food, and scarcely strength enough to come to my office. She had been ill for many months. I put her upon eucalyptol and cod-liver oil. She rapidly improved in all respects, and ceased to visit me after about two months. I had her under observation until all the objective symptoms ceased. I see her occasionally. She says my prescription has made a new creature of her. She is in her usual flesh, and is doing her work.

CASE III.—Mrs. M., aged 26, called upon me in September, 1889. She had a miscarriage in the spring. Upon rising from this sickness she took cold, and developed a cough and soreness through the lung, from which she did not recover all summer. Neither did her menses appear. She is from a consumptive family. These things alarmed her somewhat, and she applied to me for aid. Her respirations were broncho-vesicular and catchy. Her cough was quite troublesome. I gave her a prescription containing eucalyptol, and have had her under observation ever since. Her respiratory murmur is now all right, and she has menstruated once or twice since, and now seems to have gone into her menopause at this early age. She is in perfect health.

CASE IV.—Mr. B., aged 30, called upon me in December, 1889. He complained of a pain in his chest, and an inability to take deep inspirations with ease. Work involving the use of the pectoral muscles, as chopping, sawing, husking corn, etc., was painful. He was losing weight. Physical examination of the chest revealed a little dulness on percussion over the upper parts of both lungs, and a harsh and catchy respiration. I put this man upon eucalyptol, and watched the case for a year and more. The patient still complains, at times, of lameness in the thoracic parietes; but he now has less of the catchy respiration, and none of the dulness on percussion.

CASE V.—Miss McL., aged 16. In February, 1890, I was called to see this girl. I found her in bed with a temperature of 102°, a pulse of 120, and respirations 30. Cough and expectoration were present. She had *la grippe* a few months before, and had fallen into this state. Her respirations were broncho-vesicular and interrupted. I treated her symptomatically, and put her upon cod-liver oil at once. After about a month she began to walk out, and then I gave her eucalyptol besides her cod-liver oil. She continued to improve for some months, when I permitted her to go from my care to Ohio, where she has since remained. When I first saw her she was much emaciated; but now she weighs one hundred and fifty pounds. The cough and expectoration have ceased, and she is perfectly well. Several children in this family have already died of consumption, and I believe that this girl had incipient phthisis. The only thing lacking in the evidence is the demonstrated presence of the tubercle bacilli. I made no search for them.

CASE VI.—Mrs. P., aged 34, visited me in February, 1890. She had been failing for some months. She complained of pain in her right lung. The percussion note was normal, but the respiratory murmur was catchy. I put her upon eucalyptol and wheat phosphates. She soon began to revive in every way. The catchy respirations have ceased, and the patient has nothing to remind her of her former condition except her feeble endurance.

CASE VII.—Mr. Y., aged 27. In the latter part of 1889 this man was taken sick in Boston. He was treated for bronchitis, but finally had to go into a hospital. Here he heard the visiting physician, a college professor, say to a class of medical students, "We don't get hold of this case." After a few weeks' stay in the hospital he came to Michigan to accept the hospitalities of his brother. In February, 1890, I was called to see him. I found him greatly emaciated, with a temperature of 101°, pulse about 90, respirations 28, and a violent cough, raising about a pint a day of frothy and bloody sputa, containing mucus, pus, and blood. The sputa had a rank, gangrenous odor, and separated into two layers, one of mucus and blood, and one of foam. This was enough to make a diagnosis of gangrene of the lung. Physical exploration revealed a small area of flatness at the lower point of the right lung. The rest of the lung was a little super-resonant, because of its doing compensatory work. On several occasions this patient had alarming hemorrhage. I put him upon eucalyptol and cod-liver oil. He gradually improved under this treatment, and went to Canada to live upon his father's hospitality. Improve-

ment continued. And now, after a year, he says he is as well as ever.

CASE VIII.—Mr. B., aged about 60, consulted me in April, 1890. He is asthmatic, and had the grippe a few months before. He was left with a very aggravating cough. He had consulted three or four physicians without benefit before he came to me. I prescribed an emulsion of eucalyptol and hyoscyamus, and was gratified to hear from his own lips the next morning that he had spent the best night for several months. The cough ceased at once.

CASE IX.—Mr. A., aged about 40. This patient first came into my hands in July, 1890. He was emaciated, had a consumptive look, complained of pain in both lungs, and coughed some in the morning. He had just lost a brother from consumption. His respirations were jerky, and the area of hepatic flatness was enlarged. His greatest complaining was about a circumscribed point of tenderness in the greater curve of the stomach. This I believed to be a tubercular ulcer. I put this man upon eucalyptol and bismuth mixtures, and kept him under observation for a few months; but as he would not believe that anything ailed his lungs, and as his stomach was not bettered, he desisted from the treatment. It is to be said, however, that the respirations nearly ceased to be jerky during the latter part of the time that he remained under treatment.

CASE X.—Mr. H., aged 27, applied to me in January, 1891. He had had influenza, and had been left in a condition of prostration, and with pain in both lungs. I found the respirations catchy, and both lungs dull, especially in their lower portions. Strange to say, his temperature was normal, the pulse 64, and the respirations 16. Four years before an eminent physician told him that something was wrong with his lungs. He was obliged to quit work, and since has done but little. He is about five feet and eleven inches tall, and weighs only one hundred and thirty-five pounds. I put this man upon eucalyptol and cod-liver oil. Almost full resonance has been restored to the lungs, and the respirations are but slightly interrupted. There was never any expectoration. My diagnosis in this case was chronic interstitial pneumonia.

CASE XI.—Miss T., aged 29. I was called to see this patient in January, 1891. She had had pneumonia in Grand Rapids, Michigan, and had come to her sister's home a week earlier than her physician had told her she might. She took cold upon the train. This prevented resolution. I found her with a temperature of 101°, and respirations 24. The lower lobe of her left lung was flat upon percussion, and the breathing was tubular. This was some two months after the onset of her pneumonia. The expectoration was muco-purulent and abundant. I prescribed eucalyptol and cod-liver oil for her. She has steadily improved, and her prospects for an ultimate recovery are fairly good.

CASE XII.—Miss R., aged 21. On the second day of March, 1891, I was called off from the road to see this girl. About Christmas time she was taken with influenza. She partly recovered from this, and made two attempts to go back to school. Twice she failed and twice she went home. She was treated by another physician and discharged as cured. Three or four days later I was called in, as stated at the beginning of this paragraph, and found the following conditions: Temperature, 103°; pulse, 130; respiration, 24; free and muco-purulent expectorations; night-sweats; anorexia and great prostration. The respiration was catchy in both lungs and accompanied by large and small moist râles on both sides. The percussion note was somewhat dulled on both sides, especially in the lower lobes. I believed that the girl had slid from the influenza into catarrhal pneumonia, and was likely to fall into acute phthisis, and so informed the mother. I administered antipyretics and tonics, and later put her upon eucalyptol and cod-liver oil. I later examined the sputum and found swarms of the bacillus tuberculosis. The case has been in my care now two months. The temperature averaged the first month 101°; the second month 100.5°. The expectoration has grown much less. The respiration fell in two weeks to normal, and has so remained ever since. The pulse has fallen from 130 to 96, where it stays. This may be normal for her, for her two grown sisters have the same rate of heart-beat, and they are perfectly well. Her appetite is returning, and the bacilli have nearly disappeared from her sputa. The patient is still bedfast and in a precarious condition. Whatever the outcome may be, the fact is patent that the eucalyptol has done her much good. It looks as if it had averted the acute miliary tuberculosis, but also as if the patient were settling into a rapid phthisis, though no signs of cavities can be found and no râles are now heard. The respiration has ceased to be catchy, and has become smooth in all the lung except in the upper lobe of the left lung, where it is harsh

and tubular at this writing. It has been better here until a few days ago, when a sudden increase of expectoration indicated the rupture of a tubercle.

[*Later.*—Cavernous breathing is heard in both lungs. The bacilli have returned. Elastic tissue may be found in abundance in the sputa. The respirations have gone up to 26 and the pulse to 120. Death cannot be long deferred.]

CASE XIII.—Mr. A., aged 20, came into my hands the first of April, 1891. This case is far gone with consumption. He had a temperature of 102°, pulse of 110, and respiration 32. His expectoration was profuse and swarming with bacilli. He had night-sweats, tubular and jerky respiration in the left lung, pectoral pains, and was greatly emaciated. I had no expectation of producing any abiding change in this patient, but at once put him upon eucalyptol and cod-liver oil. In a fortnight his night-sweats were stopped, and the expectoration reduced one-half. The patient has been benefited by the treatment, but will die. He has had one hemorrhage since he has been in my care.

I am not putting eucalyptol forward as a specific for consumption, for it is not; but this experience has led me, as said in my opening paragraph, to put a high therapeutic value upon it in persistent irritable cough, chronic bronchitis, chronic pneumonia, and to a less degree in tuberculosis.

CASES I., XII., and XIII. were certainly tubercular. There can be but little doubt that Case V. was tubercular. V. is well; there is no prospect that XII. will get well; XIII. will die, and I. is already dead. Case VII. was a case of gangrene of the lung, and has recovered. Cases II., III., IV., VI., IX., and XI. had symptoms of incipient phthisis. All are living, and in as good or better health than they were a year ago. Case VIII. was a case of irritable cough. Case X. is a case of chronic interstitial pneumonia. VIII. is cured and X. is much improved.

Eucalyptol is very permeating. It is eliminated by the lung, the skin, and the kidneys. It can be smelled upon the breath, upon the clothes when changed, and in the urine. It is antiseptic. It has a healing effect upon the bronchial epithelium, and a sedative effect upon the peripheral nerves in the respiratory tract. It is because of these physiological effects that the therapeutic results are produced.

I administer it in five- to ten-minin doses in emulsion every four hours.

IODIDE OF POTASSIUM FOR THE DIAGNOSIS OF PHTHISIS.

STICKER renews an observation made by him a few years ago, which he has in the mean time confirmed, and successfully used for the diagnosis of doubtful phthisis. He finds that where a lesion exists at the apex of a lung, suspected by an impairment of resonance, and alteration in pitch or a harsh respiratory murmur, but without râles or blowing murmur, the latter may be produced by giving, for a few days, small doses of iodide of potassium. It seemed as if the drug stimulated secretion, especially in the neighborhood of diseased tissue, thus giving rise to râles. If moderate doses of the iodide be administered to a healthy person, no changes can be detected in the lungs; but in a case of diffuse dry bronchitis, in the course of a few days an extensive moist catarrh, with fine and coarse moist râles, results. Similar manifestations appear in the area of circumscribed pleural adhesions or pleuritic roughenings. Not rarely the evidences of local reaction are gradually obscured by the signs of diffuse catarrh. In four cases of suspected tuberculosis, in which repeated physical examination of the lungs proved negative, the administration of the iodide for diagnostic purposes produced distinct signs of localized reaction in one or both apices, with tuberculous sputa.—*Boston Medical and Surgical Journal*, June 4, 1891.

FUMES OF THE BROMHYDRATE OF AMMONIUM IN ASTHMA.

Being familiar with the favorable action of the fumes of ammonium chloride in some forms of bronchitis and naso-pharyngeal catarrh, the idea suggested itself to DR. MAXWELL to test the fumes of the bromide of ammonium in asthma (*Journal de Mèdecine de Paris*, May 31, 1891).

To obtain these fumes he employed bromhydric acid of a specific gravity of 1.7, and it is stated that but few inhalations are required to cause the immediate disappearance of the dyspnœa, while sometimes, he writes, by causing the inhalations to be used at the time a dyspnœic attack is threatened the asthmatic seizure has been entirely prevented. In order that the fumes should have a neutral reaction they should be passed through a wash-bottle.

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Leading Articles.

NATURE AND TREATMENT OF DIPHTHERIA.

IV.

FRESH evidence has been steadily accumulating to prove the invariable causal connection between Lœffler's bacillus and ordinary diphtheria, and since our last article Prudden's important communication has appeared, in which he concedes to this microbe the primary *rôle* in the etiology of this disease (*Medical Record*, No. 1067). Dr. Welch, of the Johns Hopkins University, has published the results of his and Dr. Abbot's studies at the Johns Hopkins Hospital, and add striking confirmation to the data on which have been founded the doctrine of the primarily local origin and development of the infection, a doctrine which, we observe, has been lately conceded by Cadet de Gassicourt, though opposed in the first edition of his masterly work ("Leçons Cliniques sur les Maladies des Enfants," t. iii., 1884).

"Of capital importance," says Professor Welch, "is the establishment of the fact that the diphtheritic bacillus develops only locally at the site of infection, and does not invade the tissues or the circulation. It is found only in the diphtheritic pseudo-membrane, and not even in the subjacent mucous membrane. Indeed, it is only the superficial parts of the false membranes which contain the bacilli. The determination of this fact gives at once a clear and decisive answer to the long-mooted question as to the primarily local or constitutional nature of diphtheria. The germ which causes this disease not only makes its first appearance and multiplies where the pseudo-membrane is formed, but it does not even subsequently invade the blood and organs. As we shall see later, the constitutional symptoms are due to the reception of a chemical substance or substances of remarkable toxic properties produced by the local development of the diphtheritic bacillus" (*Medical News*, May 16, 1891, p. 559).

We are, then, again brought around to the primary indication of treatment, made more and more certain and imperative as researches accumulate,—*to destroy the contagium in situ, before the microbes have had time to elaborate their poisons and infect the organism.*

Under this head, we need add but little to what has been said in previous numbers. It would seem that diphtheria primarily occurring on any accessible *cutaneous* surface might always be readily arrested by deep, thorough cauterization. Such cases are, however, very rare, and, when they occur, generally follow inoculation of a wound. The primary lesion is too often on mucous surfaces, which, like the posterior nares and the larynx, are not easily amenable to thorough topical treatment.

What shall be the treatment of the toxæmia resulting from absorption of the poisonous principles produced by the bacilli? Every physician is familiar with the change which often takes place at a variable time—two, three, or four days—after the first appearance of the patches; the sthenic symptoms, on which hope was based, give way to symptoms of prostration, and the system seems overwhelmed by a paralyzing poison.

Ignorant of the proper antidotes of this poison, if such exist, we can only combat it on general principles, by stimulants and tonics. The internal employment of corrosive sublimate in frequent doses of $\frac{1}{100}$ to $\frac{1}{4}$ grain, or of calomel ($\frac{1}{6}$ to 1 grain every hour), is no longer justified on the ground of a microbicide action exercised by these drugs, for the constitutional symptoms are not due to the microbes, but to their soluble products,

and there is no evidence that mercurials destroy these products in the blood.

The same judgment must be passed upon the sulphites and hyposulphites, counselled by Giacchi and Polli, in Italy, phenic and salicylic acids, vaunted by Bernier, in France, and Foutheim, in Germany, and benzoate of sodium, recommended by Helferich, Sanné, Love, and others.

If the internal use of corrosive sublimate has been attended with good results, these might very properly be attributed to the topical action of the mercurial while passing over the mucous membranes in the act of deglutition, and not to any effect on the blood. *Per contra*, there is reason to believe that the *tinctura ferri chloridi*, one of the best topical remedies, may exercise beneficial constitutional effects. Recent investigations (as those of Ferguson) have shown that the diphtheritic poison rapidly spoils the blood corpuscles; there are still lacking observations which directly show that tincture of iron retards this disintegration, although good authorities, basing themselves on large clinical experience, believe that this preparation, freely and continually administered, does have this power.

Dr. Whittier (*Boston Med. and Surg. Journal*) believes that this medicine, given so as to saturate the system, is the best that can be employed. Barach (*Med. Record*) prescribes hourly doses, in quantity varying from 8 to 25 drops, mixed with glycerin and water. Food and stimulants are administered before the iron, but not immediately afterwards, so that the iron may first have a local effect on the fauces.

"That now, after thirty years' constant use of the tincture of chloride of iron in both hemispheres, there is an almost unanimous verdict in its favor, renders it probable that the few who have not observed good effects have treated unusually bad cases, or have given the medicine in small and inadequate doses" (Dr. J. Lewis Smith).

The employment of pilocarpine (either by potion or by subcutaneous injection), first recommended by Guttman, has gone out of use. Archambault, Schmidt, Alfoldi, Jacobi, and J. Lewis Smith have pointed out the dangers of this treatment. Sudden filling up of the bronchial tubes, with secretion and heart-failure, have not unfrequently followed its use.

Quinine has been much prescribed in diphtheria, and when given in sufficient doses doubtless does have some tonic effect; it is, however, depressing in large doses, and, on account of its bitterness, is always repugnant to children. "It does not," says Smith, "seem to exert any decided action upon the local affections or blood-poisoning in diphtheria."

The same judgment may be passed on the internal administration of chlorate of potassium, a remedy, doubtless, too much administered, being of no specific value, and being toxic in large doses.

Alcoholic stimulants have an important place in the therapeutics of diphtheria, and many authorities, as Jacobi, recommend quantities that in health would be toxic. J. Lewis Smith does not hesitate to give a teaspoonful of good brandy or whiskey hourly to a child of 5 years, and Jacobi states that he has often seen children get well with ten ounces a day who were doing badly with three or four. Cadet de Gassicourt (*Traité Clinique*, etc., t. iii.) would give to a young infant from half an ounce to two ounces of old rum or brandy per day.

Caffeine, camphor, strychnine, and Siberian musk have been recommended to counteract depression and heart-failure. Jacobi believes musk to be the best stimulant in urgent cases of heart-failure. "If," he says, "10 to 15 grains, given [in thin mucilage] within three or four hours to a child of 1 or 2 years, do not restore a healthy heart action, the prognosis is bad."

Zannelis (*Bull. et Mém. de la Soc. de Méd. Pratique*, 1889), speaks favorably of strong infusions of tea or coffee in adynamic stages. Nourishment should be for the most part liquid, for obvious reasons: the digestive functions are depressed and the frequent ingestion of medicine and alcoholic stimulants more or less interferes with the secretion of gastric juice and the formation of peptones; the mechanical obstacles to deglutition are frequently considerable, and anorexia is generally a marked symptom in the toxic stage. Hence milk, beef juice, liquid peptones, raw eggs beaten up in milk, given in such quantities as can be tolerated and *not too often* to interfere with the administration of antiseptic medicines and of alcoholic stimulants, are especially indicated.

In this series of articles it has not been our purpose to take up the treatment of the different forms of diphtheria, or even to allude to the therapeutics of croup, but only to discuss the general principles of treatment in the light of the recent bacteriological researches.

THE TREATMENT OF AORTIC DISEASE.

IN aortic disease, whether the morbid condition be constriction, insufficiency, or aneurism, the arterial outflow is embarrassed, and unless the compensatory hypertrophy be sufficient through the extra power thereby given to the heart-muscle to insure filling of the arteries, the whole organism suffers in its nutrition and function. There is pronounced anæmia, which is manifested by general enfeeblement, and the usual subjective and objective signs. But there is something more than anæmia. The blood-depurating organs participate in the general disturbance of nutrition, and imperfectly eliminate waste elements; and to the poverty of arterial blood in the system is added a more or less toxic condition of the blood. The cachexia of advanced states is most marked.

Now that we are better acquainted with the conditions productive of aortic affections, we know that the latter are often the expression of a wide-spread disease of the arteries,—arterio-sclerosis; the victim of heart-disease has interstitial nephritis, and sooner or later becomes uræmic.

A peculiar state of mental irritability generally accompanies aortic disease (*faiblesse irritabile*); this may amount to mental alienation.

Among the symptoms of aortic disease are paroxysmal crises of dyspnœa, especially frequent at night, and attacks of præcordial pain, which arrest the patient in his occupation; if he is walking, compel him to stop and lean against some support. These heart-pangs, at first momentary, are dependent on exertion; they become intensified in extensive atheromatous disease of the aorta involving the coronary arteries, and in both the milder and severer forms constitute true angina pectoris. It may not be easy to give a satisfactory explanation of the cause of the pain in this distressing disease, or why it takes on an intermittent, paroxysmal character; but it is known that sudden deprivation of blood in a part is followed by agonizing pain,—witness the pain attending embolic obstruction of a large artery,—and it is known that such relaxant, vaso-dilator medicaments as morphine, nitroglycerin, nitrite of amyl most speedily and effectually relieve the suffering of angina pectoris; the presumption, then, is that the essential condition of this pain is a spasm of the arterioles, brought on by visceral troubles, emotions, or exertion, and converting, as Huchard somewhat singularly expresses it, *ischæmia* of the myocardium into *anæmia* of that muscle. There is now not merely deficiency of blood-supply; there is almost complete suppression.

The treatment of aortic disease is,—1, curative; 2, symptomatic.

1. The causal indication is generally impossible of fulfilment; in valvular cardiopathy, little can be done but to await the compensatory hypertrophy and meet symptoms as they arise. Overwork and worry, and all emotional states, should be avoided as aggravating existing lesions. By careful hygienic observances and a fortifying regimen, the heart should be made equal to its tasks. When this becomes impossible, the daily work should be levelled down to the capacity of the heart.

"In aortic insufficiency," says Dujardin-Beaumetz, "it is not the fault of the heart if there is anæmia of the arterial system; it is the fault of the valves, and you can do nothing to remedy this lesion. Your efforts will be directed towards combating the anæmia by a treatment designed to augment the local circulation in certain organs, and of these the brain is the most important."

In arterial cardiopathy, much can be done to fulfil the causal indication if treatment is begun early. The treatment, says Huchard, who has written voluminously on this subject, should be directed towards the arterial hypertension. We must spare the heart and diminish the peripheral resistances; forbid all medicines capable of producing vaso-constriction, such as ergot, chloral, lead, belladonna, digitalis, quinine, arsenic, aconite, belladonna, and hyoscyamus; proscribe tea, coffee, abundant drinks (which increase arterial fulness and tension), spirituous liquors and strong beers, pure wine, all table excesses, too rich and too azotized a diet, emotions, hard work, and all overwork.* Believing that arterial hypertension is in a certain measure of toxic origin, by reason of the incomplete elimination of organic waste matters, Huchard would proscribe broths, *bouillons*, and fat stews, which are veritable "solutions of poison" for all patients in whom urinary depuration is incomplete, and he would give the precedence to milk over all other articles of diet; while a mixed diet, consisting chiefly of white meats and fresh vegetables, should be recommended. Of medicines, those should be chosen which

* H. Huchard, "Maladies du Cœur et des Vaisseaux." Paris, 1889.

promote vaso-dilatation and lowering of arterial tension, such as nitroglycerin, iodide of potassium or sodium, nitrite of sodium and opium. All the accidents of arterio-sclerosis of the heart and aorta are amenable to iodide of sodium, which is curative if any one medicine can be regarded as such; the dose, according to Huchard, is 10 grains three times a day, to be continued for months, or as long as tolerance can be maintained.

2. The symptomatic treatment of aortic disease is largely concerned with the anæmia resulting therefrom, and the nervous and cerebral troubles. A leading indication, then, is to flush the cerebrum with arterial blood, and thus improve its languishing nutrition. Here we have one remedy of sovereign efficacy, which both energizes the circulation and relieves dyspnœa and pain. "Opium," says Gubler, "causes a peculiar excitation, gives fulness to the pulse, raises the temperature, augments the injection of the teguments, and promotes diaphoresis. The countenance brightens, the eyes become brilliant and moist, the pupils contracted, the skin covered with perspiration, then quiet sleep ensues."

No one who has had much experience in the treatment of the chronic aortic affections has failed to observe the charming effect of a hypodermic injection of morphine,—⅛ to ¼ grain; but it will generally be necessary to resort to these injections very often,—every day or two,—in gradually-increasing doses, and there will be danger of making the patient a victim of the morphine habit. It is, however, a choice between two evils in an incurable disease, which is steadily growing worse.

As morphine is constipating, laxative medicines will be constantly required,—cascara sagrada, syrup of senna, compound decoction of aloes, Carlsbad salts, etc., or even more energetic purgatives. Free depuration by the bowels is especially necessary where the kidneys are affected and uræmic symptoms present themselves.

Not much can be said commendatory of the free use of alcoholic stimulants in aortic disease, for they both promote granulo-fatty degeneration and arterio-sclerosis. If prescribed at all, they should be given rather to remedy a sudden depression of the vital forces than as parts of a routine tonic medication. Tobacco should be altogether interdicted.

Digitalis, so potent in mitral disease, is too much of a vaso-constrictor to be applicable to aortic disease with unfilled arteries, in which an important indication must ever be to diminish peripheral resistances. If there were a remedy, which, combined with digitalis, would counteract the action of the latter on the arterioles, it would enable us to utilize to advantage the cardio-tonic properties of digitalis in aortic disease. It can hardly be said that the combination with nitroglycerin has proved to be a success.

The dyspnœa and the angina pectoris, which so generally, if not inevitably, complicate aortic disease in its declining stages, are better combated by opium or morphine, nitroglycerin and nitrite of amyl, and iodide of sodium, and by a milk diet, than by any other treatment.

If digitalis is contraindicated in aortic disease, the same may be said of strophanthus and adonidin; at the same time, in the period of asystolism, when the pulse is irregular and rapid, and vascular tension is low, these heart tonics, judiciously administered, are just as useful in rallying the failing heart-muscle as in the asystolism of mitral disease.

PREDIGESTED FOODS.

THE problem of feeding the sick is often one of the most difficult the physician has to solve. Following Sir Wm. Roberts's demonstrations of the value of pancreatic preparations in artificial digestion, great progress has been made, but there is still scope for further advance. Commercial enterprise has done much both to forward and to retard the movement, for while, on the one hand, manufacturers, possessing a scientific spirit, have endeavored to produce artificial foods which should not alone be profitable to them, but also of service to the sick, other manufacturers continue to place on the market, with high-sounding pretensions, preparations which no longer represent the best attainable results. In a recent paper before the Philadelphia County Medical Society, Professor Chittenden, of Yale, reported on the nutritive value of the best-known beef preparations in the market. Setting aside their value as stimulants, whatever that may be, he again conclusively demonstrated the practical worthlessness as nutritives of the group of "beef extracts," "beef juices," "liquid foods," etc., made after Liebig's formula, or consisting, as do some more modern preparations, of blood and alcohol. On the other hand, preparations which contain partially-digested beef fibre, reduced to powder by desiccation, were shown to have

considerable nutritive value; varying from one hundred and forty-seven per cent. in the case of beef peptonoids to four hundred per cent. in the case of Mosquera's beef-meal, estimating on a standard of one hundred per cent. for lean beef. Of course, laboratory analysis cannot replace clinical experience; but the two together will enable a just estimate to be made as to the field of usefulness of preparations of different types, and in assisting us to determine to which element in any preparations its particular usefulness is to be attributed. The preparation for ready assimilation without much further expenditure of energy by the patient, which is the characteristic of the peptone group of foods (using the term broadly), is unquestionably a great factor of their power for good.

Whether digestion by the pineapple ferment, as in Mosquera's beef-meal, will be equally efficacious with digestion by pancreas ferment, as in the older preparations, remains for clinical experience to decide. There is *a priori* no reason to doubt its efficacy, and the reports thus far available seem to confirm it. Should it be established beyond question, the highly concentrated character of this food—four hundred per cent. in Chittenden's table—will render it of especial value in wasting diseases, such as phthisis pulmonalis and diabetes, in which a nitrogenous dietary is strongly indicated. In carcinoma, and for rectal feeding, in cases of gastric ulcer, for example, it will have a decided usefulness. In acute febrile conditions, associated with gastro-intestinal disturbances, on the other hand, the Liebig group of foods have a limited, but none the less certain, value in carrying the patient over a crisis in which absolute nutrition in the sense of repairing tissue-loss is of less moment than the liberation of energy in the nervous and circulatory apparatus. Like alcohol, caffeine, and strychnine, these foods contain principles which are available for such purposes, and are quickly taken up by the blood and brought into service. Their small nutritive percentage is in this case rather an advantage than otherwise.

It must be distinctly remembered, however, that we are not feeding the patient with these preparations, and that his tissues will be entirely consumed unless we repair them by other means. Thus in each individual case it becomes a matter of nice judgment to determine how long the patient may be allowed to go without food, or with a minimum of food, while his organic functions are maintained by his stores of reserve energy, assisted and guided by therapeutic administration of drugs, whey, fruit juices, and beef extracts. The food preparations may be advantageously combined at times with the stimulant preparations. Thus peptonized milk or peptonized beef, prepared at home, may be alternated with home-made beef-tea, or the two kinds of preparations be mixed and given together. A quite important point in cases requiring nice management is to give but small quantities of food, and to allow a sufficient interval to elapse between feeding times.

A patient given 4 ounces of food every hour will often vomit it all, when 2 ounces or less every second hour will be retained and utilized. While a return to the practice in vogue before Graves "fed fevers" would be unwise in the extreme, yet it is well to remember that even "fevers" may be "overfed."

THE VALUE OF AGARACINIC ACID AS AN ANTIHYDROTIC.

THE antihydrotic properties of white agaric (*Polyporos officinalis*, Fries) have been long known. Schmiedeberg and Fleury, in 1870, found in this fungus a resin and an acid giving the formula of $C_{16}H_{28}O_5$ to the latter. In 1883 E. Jahns extracted a bibasic, triatomic homologue of malic acid, to which he gave the formula $C_{16}H_{30}O_5,H_2O$. In 1881, Norris Wolfenden, and in 1882, Dr. Young, experimented with the crystallized principle which they had extracted from an alcoholic tincture of agaric, which they denominated as agaracine, and which they stated to be an active principle of agaric; finding that this principle had the power of notably diminishing night-sweats, calming cough, reducing fever, slowing the pulse, while at the same time being slightly laxative. Seifert, also experimenting with this principle, agaracine, in the pill form, in doses of $\frac{1}{12}$ grain, while noting a diminution of cough in cases of phthisis, did not succeed in all cases in arresting night-sweats, although doses of from $\frac{1}{10}$ to $\frac{1}{8}$ grain succeeded better in his hands.

Proebsting, later, in 1884, in comparing the action of atropine and agaric acid, concluded that the latter was twenty times less efficacious than the former.

In 1885, Senator wrote that the remedy in his hands was by no means infallible in arresting night-sweats, that it occasionally caused diarrhœa, and that it should always be associated with about $\frac{1}{4}$ of a grain of opium. Finally, in 1886, Piernig concluded that agar-

acine was always efficacious in the diminution or suppression of the night-sweats of phthisis, without its producing any modification in the frequency or the rhythm of respiration or without interfering with the normal functions of the skin or pulmonary exhalation. Thus, it is seen, as we have already a number of times noted in previous numbers of the GAZETTE, that the principles of agaric are of the most marked activity as antisudorifics, and we have mentioned that the purgative effects which sometimes follow the use of agaracine are in all probability attributable to the presence of the impurity termed agaracol by Schmieder. This latter substance, however, according to Hofmeister, is quite negative. In the *Bulletin Général de Thérapeutique*, May 30, 1891, Dr. Combemale states that a substance placed on the market under the name of agaracinic acid should be regarded as a perfectly pure principle of agaric, and that this is the only antisudorific element in the white agaric. Hofmeister had, in 1889, already demonstrated that in warm-blooded animals agaracinic acid produces progressive paralysis of central origin, with reduction in the force of the heart and surprising or marked diminution of cutaneous secretion. In the dog 15 grains of this acid produced vomiting and diarrhœa. After the subcutaneous injection of 4 grains of agaracinate of sodium in rabbits, marked somnolence was produced, with slowing of the respiration and increase in their volume. In more marked degrees of poisoning respiration assumes the dyspnœic type, while at the same time the blood-pressure is first increased and then diminished through stimulation, and then final paralysis of the vaso-motor centre and the pneumogastrics. Ordinarily death follows from arrest of the respiration. Experiments made directly as to the action of agaracinic acid on the cat showed that, like atropine, this substance paralyzes the nervous apparatus of the sweat-glands, although, unlike the latter, it has no marked action on the heart or on the pupil or on the salivary or lachrymal secretions. Hofmeister also showed that agaracinic acid was a powerful local irritant, and when injected subcutaneously produced marked inflammation, which tended to pass into suppuration. Professor Kahler, in Prague, employed agaracinic acid in doses of ¾ of a grain, or even 1½ grains, in a number of cases of phthisis, and found that, although it occasionally produced slight transient nausea, no symptoms of poisoning were produced; and in fact the dose might be increased up to 3 or 5 grains without hurtful effects, and was in such doses very reliable in reducing night-sweats. Finally, also, Klemperer likewise confirmed the value of agaracinic acid as an antihydrotic, at the same time finding it to be free from danger.

It would thus seem that the antisudorific properties of the white agaric known for so long a time, and which were first supposed to be located in agaracine, and then in agaric acid, are now finally, with considerable show of probability, confined to agaracinic acid. This principle may be extracted from the white agaric by 90 per cent. alcohol, which precipitates a great part of the resinous matter out of solution, and then purified by repeated crystallization in absolute alcohol. It then occurs in the form of a silky-white powder composed of microscopic prisms, is inodorous, tasteless, and melts at 130° C. It is soluble in alcohol, less soluble in ether, acetic acid, and cold water. It is very soluble in boiling water, from which it is again deposited on cooling. It is a triatomic and bibasic acid, which at 140° is partially converted into an anhydride. It forms salts with sodium and potassium and silver.

Dr. Combemale reports seventeen cases, which seem to show that agaracinic acid is itself possessed of marked antisudorific properties, arresting sweats in pulmonary tuberculosis and in other forms of poisoning or infection. In pulmonary tuberculosis, he suggests, it succeeds in producing relief from this distressing symptom, even in the final stage of the disease. Doses of ⅓ to ¾ grain given in pill form are quite sufficient to produce this effect. Dr. Combemale's observations have showed that the continued employment of this remedy produces no disturbance either of the digestive organs or of the general health. One of his cases received this substance in pill form daily for more than a month. Dr. Combemale further calls attention to the fact, which has been noted in other antisudorifics, such as the tellurate of sodium, that cessation of night-sweats will lead to dyspnœa in some cases. This, however, is not to be regarded as the effect of the remedy, but to a suppression of the eliminating function of the skin. Dr. Combemale's cases seem to show that its action on the sweat may be manifested two hours after the administration of the dose, the maximum effect appearing about five hours after the administration, and lasting for about six hours more.

Finally, Dr. Combemale concludes that

agaracinic acid is superior to any other remedy used for the suppression of night-sweats, and that, being free from the resins and the oils which contaminate agaracine and agaric acid, it is the only principle of white agaric which should be used for the suppression of night-sweats.

Reports on Therapeutic Progress.

TREATMENT OF HYDROCELE BY CARBOLIC ACID INJECTION.

At the meeting of the New York State Medical Association, recently held in Brooklyn, DR. S. E. MILLIKEN read a paper upon the treatment of hydrocele, in which he contrasted the method of treatment by injections of carbolic acid with the radical or cutting operation (*Medical Record*, June 20, 1891).

The radical or cutting operation of Volkmann, and its various modifications, he said, while usually successful in relieving the hydrocele, required the use of an anæsthetic and a week or more in bed should suppuration occur. The method of Levis, by carbolic injection, was practically painless, confinement to bed was in no sense essential, and unless an inordinate amount of carbolic acid (over thirty minims) were used, sloughing ought never to occur. The simplest and most efficient apparatus for the purpose was a small trocar and a hypodermic syringe. After thorough evacuation the syringe was screwed on to the canula, and the injection could thus be made without a single drop of the acid coming in contact with the skin of the scrotum. When from five to twenty-five minims of pure carbolic acid were distributed over the whole serous surface (two or three, minims in each place) nothing more than a sense of warmth was experienced by the patient. After removal of the canula, slight kneading of the sac might be made to insure thorough coating of its walls with the irritant. Usually within twenty-four hours the height of the inflammatory reaction would have been reached; and thus, if a laboring man were injected on Saturday, he would be entirely able to go to his work as usual on Monday morning.

Of fifty-four cases thus treated by Dr. Milliken, at the Hospital for Ruptured and Crippled, nine were never seen after the injection, five paid one visit within the first week only, and four were at present under observation. All the remaining thirty-six could be set down as completely cured; and of these, twenty-seven had one injection, four had two injections, and five had three injections. In no case had sloughing occurred, and not one of the patients lost more than twenty-four hours from business. From two to six weeks was necessary for absorption of the exudation to take place, and thickening of the sac might remain much longer than this.

The conclusions reached by the author were as follows: 1. Carbolic injection is a safe method for the cure of hydrocele. 2. It is practically painless. 3. The patient can attend to business without more than one day's delay. 4. The disagreeable effects of an anæsthetic are avoided.

DR. WILLIAM R. BALLOU thought that the injection of carbolic acid was greatly preferable to that of iodine. Hare had collected a large number of cases in which great destruction of the tissues, and one case in which fatal iodine-poisoning, was caused by the latter. The danger of iodine-poisoning seemed to him to be the most serious objection to the use of this agent. He should like to call attention to one point, and that was, that thin sacs do not require carbolic injection. At the New York Polyclinic, Dr. Fluhrer used an aspiratory needle three inches long and of rather large calibre in connection with the hypodermic syringe. A solid metal staff having been introduced into the urethra, the fluid was evacuated and a large quantity of carbolic acid (from sixty to eighty minims) was injected into the sac. It seemed to him, however, unnecessary to use such a large amount when such excellent results as those reported by Dr. Milliken could be obtained with a small amount. In cases of Bright's disease the method by carbolic injection was especially indicated, since the Volkmann operation required the use of an anæsthetic, and it was well known how dangerous ether was when disease of the kidneys was present.

DR. WILLIAM T. WHITE said that he had never used carbolic injection, but had always depended on the use of iodine, from which he had never seen any of the bad results that had been spoken of. The first injection was almost always successful, so that it was seldom necessary to repeat it. Sometimes, however, considerable inflammation was occasioned, necessitating the patient's remaining in bed for two or three days, and if this could be avoided by the use of carbolic acid it was certainly a point gained.

DR. MILLIKEN said that he had omitted in the paper to say that he usually directed a suspensory bandage to be worn for the first two

weeks, and that he employed for the injection equal parts of glycerin and carbolic acid. It was important that there should always be sufficient fluid to make a perfect solution. He preferred to use ten to twenty minims, and repeat the injection a second, or even a third time, if necessary, rather than to use a large quantity of the acid a single time. In cases where the trouble returned, it was always noticeable that the hydrocele was never as large as it had been originally. He had never had any personal experience with the use of iodine, but in all the cases that he had seen treated in this way by others the pain inflicted was much greater than when carbolic acid was employed. In regard to iodine, he was not so much in fear of the sloughing liable to be caused by it as of iodine-poisoning. The painlessness of carbolic acid he thought was a great point in its favor. With it, it was never necessary to use cocaine, as the puncture of the small trocar did not cause any more inconvenience than that of the hypodermic needle for the introduction of cocaine.

Dr. John Murphy said that he had known of three or four cases in which carbolic acid used in this way was followed by very bad effects, especially on the kidneys. About a year ago he had seen a case of this kind terminate fatally, and he could not attribute the death to anything but carbolic-poisoning. It was very difficult to eliminate carbolic acid from the system, and it was very apt to have some destructive action and to select the kidneys for this. In his opinion there was nothing better for the treatment of hydrocele by injection than Lugol's solution, and he had never seen any bad effects result from its use.

THE TREATMENT OF THE CEREBRAL ATROPHIES OF CHILDHOOD.

At the meeting of the New York Neurological Society, held June 3, 1891, Dr. M. A. Starr read a paper on the cerebral atrophies of childhood, with special reference to surgical treatment (*New York Medical Journal*, June 20, 1891).

He said that the propriety of surgical interference in cases of cerebral disease was one of immediate and increasing interest, and therefore one which should be frequently discussed by those who were in a position to reach decided opinions. There were so many forms of cerebral disease in which the possibility of operations might be admitted that a general discussion of the subject did not produce definite results; therefore he would devote his paper to a particular class of cases,—viz., the cerebral diseases of infancy and childhood. The immediate result of certain cerebral diseases in infancy was to produce definite symptoms, giving rise to three types of cases,—first, cases of hemiplegia, with or without athetosis; secondly, cases of mental defects of various grades; thirdly, cases of sensory defects of various kinds. And since epileptoid seizures of the *petit-mal* or *grand-mal* type were frequently met with in any of these forms, and might perhaps be the particular symptom in regard to which advice was sought, it was evident that the discussion must include the surgical treatment of non-traumatic organic epilepsy in children. The symptoms of the first class were the sudden development of a unilateral paralysis after a series of convulsions, attended by high fever, other febrile symptoms, and a period of unconsciousness of varying duration, then a gradual improvement in the paralysis after all active symptoms of the onset had subsided. Finally, there was a stationary condition in which the face was hardly affected in its voluntary or automatic movements; the speech was usually regained if it had been lost; the arm was quite seriously paralyzed, the fingers being stiff and awkward, and sometimes being in constant, slow involuntary motion; and the leg was held rather rigid, so that the child limped in walking and sometimes had a club-foot. In all cases the paralyzed limbs were found to be affected in their growth and development, so that they were smaller, colder, stiffer, and weaker than the others; the reflexes were exaggerated, but the electrical reactions were not quantitatively changed and sensation was normal. This condition remained through life as a permanent defect. In over half of these cases epileptic attacks were of frequent occurrence. The cases which dated from birth must be divided into those in which there had been evidence of traumatism during labor and those in which there had been nothing about the delivery sufficiently unnatural to awaken a suspicion of trauma. In the former class it might be stated that cerebral hemorrhage—usually meningeal—was the cause of the symptoms. In the latter class it was probable that an intrauterine encephalitis or some unknown cause had prevented the fœtal brain from developing. The degree of spontaneous recovery in any case could be pretty well determined by an examination at the end of the second year; but it was evident from data on the question that a complete cure never occurred. The fits in organic epilepsy were more likely to be frequent and severe than in idiopathic epilepsy. These attacks did

not destroy life, but, of course, rendered life a burden, and almost any means for their relief was countenanced. The second class of cases presented mental defects rather than physical symptoms,—defects which could not be educated out of the patients, in which no amount of training could produce an appreciation of the fitness of things. The third class presented no motor or mental deficiencies. Those affected were capable of training, but had defects of sensory perception which indicated gross cerebral disease. Many cases of deaf-mutism belonged to this class, also cases of hemianopsia. In regard to this latter condition, the author gave the history of the case of a little girl, aged 12 years, who had suffered all her life from frequent attacks of *petit mal* and occasional attacks of *grand mal*. She had never been able to see objects approaching her from the left side. It was learned from the mother that the child had been born with much difficulty, that the labor had been prolonged, and that the head was greatly misshapen and had a large caput succedaneum over the posterior part. When the child's head was inspected it was found that there was a perceptible flattening of the skull over the right occipital region. The eyes, when examined, showed a contraction in the visual fields. It seemed reasonable to suppose that this patient had a defective development of the right occipital lobe of the brain, and that this involved the cortex and also the subcortical tract. Wilbran had shown that a purely cortical lesion produced symmetrical defects in the visual fields, while subcortical lesions produced asymmetrical defects. The pupils, in the cases reported, responded to light thrown upon the blind field of the retina; hence the lesion was not in the optic tract. There had never been any hemianæsthesia or hemiplegia; consequently the lesion was not in the thalamus or near the internal capsule. The patient had been brought for treatment for epilepsy, and it was an important question to decide in regard to the possible benefit of surgical interference. The author thought that any solution of the problem of operative treatment must be based upon two considerations,—first, the pathology of the cases; and, secondly, the results of experience when such operations had been done. From the records of the pathological conditions found, two facts were elicited,—first, that the different clinical types were due to the different situation of the lesion rather than to its varying nature; secondly, that the various processes of disease had, as a fairly uniform result, a condition of atrophy with sclerosis of the brain. In cases of the first type the sclerotic atrophy involved the motor area of the brain, the central convolutions and their immediate vicinity, including the tract arising from them, and usually the basal ganglia as well. In cases of the second type, the sclerotic atrophy involved the anterior portion of the brain, and sometimes the entire hemisphere to a greater or lesser extent. In the third type, the sclerotic atrophy involved the posterior and lateral parts of the hemispheres. The hypothesis was that the origin of the disease lay in some interference with the blood-supply of the part, since it had often been evident that the atrophy was limited to the region nourished by blood reaching it through one arterial trunk. This hypothesis was weak from the fact that at autopsies it was very rare to find vascular lesions in the brains of infants. Consequently the pathogenesis of these defects was as yet quite obscure. From the records of operations done in six cases of the first type it was evident that this method of dealing with the disease offered no relief. In regard to the second type, the author thought that the pathology contraindicated an operation. To the third type, cases of sensory defects, there were no facts of a surgical kind to present, but, judging from the pathological resemblance between them and the first two classes, there was no reason to expect any different result from surgical treatment. It was concluded: (1) That in infancy and childhood, mental defects, hemiplegia, and sensory defects, of a year's duration, were usually due to an incurable atrophy of the brain-substance. (2) That in such cases surgical treatment could not afford any relief, for there was no probability of an increase of intracranial pressure to be relieved, and the pathological state was one that could not be treated. (3) That the sudden onset of such symptoms in childhood, while awakening a suspicion of cerebral hemorrhage, did not invariably indicate it and could not be made the basis for an operation, unless many other facts made the diagnosis quite clear. (4) That the occurrence of epilepsy in such cases might be made the basis of an operation, for, while the epileptic attacks were of organic origin and would persist, their frequency might be much diminished. In such cases the opening in the skull should not be filled by bone. It had seemed possible to the author that the existence of a movable connective-tissue valve of scalp covering the opening in the skull and varying in its tension might have something to do with the cessation of the fits. In watching such a valve he had noticed great variation in

its tension, and the idea of it as a safety-valve had been forced upon him. Finally, he would urge upon neurologists the necessity of very great caution in recommending surgical interference in the class of cases which belonged to cerebral atrophies.

Dr. B. Sachs said that on the whole he was in agreement with the author of the paper, but that some of his views might be open to criticism. He thought that as a general proposition little could be gained in the treatment of the class of cases referred to by surgical operations, but that there was a decided field for the surgeon if the case was taken in hand early. He thought there was much more hope for these patients if they could be operated upon at the time of the initial lesion, before degenerative changes had taken place. He considered it worse than useless to operate in a case of sclerosis or proencephalia. He thought Dr. Starr was mistaken in saying that in every case there must be wide-spread secondary degeneration. Secondary degeneration did not follow many diseases of the brain, but not in all cases he was satisfied. The speaker was convinced that much good was done by the puncture of old hemorrhagic cysts; he had seen the epileptic attacks very much diminished by this procedure. In the radical treatment of cerebral atrophies, unless the entire diseased area was removed, no good could come of an operation. In regard to the safety-valve question, nothing could be gained by such an operation unless the dura was opened; even then, if epileptic attacks were to be cured, the centre from which they emanated would have to be excised. This latter operation might leave the patient with a paralysis, but with a cure of the epilepsy; which of the two was the greater evil would have to be determined by those most interested. Where there was not thought to exist a sclerotic condition, and where it was supposed the initial lesion could be attacked, an operation might be done, but it must be borne in mind that children did not bear surgical operations upon the brain as well as adults. The speaker did not see how Dr. Starr could make the statement that the growth of the skull and that of the brain were necessarily synchronous, when their growth was independent each of the other; however, when the skull ceased to be yielding, the brain was certainly at a disadvantage.

Dr. H. D. Chapin said that too early closure of the fontanelles was supposed by some to prevent evolution of the brain, but it was a question whether the closure was due to the microcephalia or the reverse. As to an operation in these cases for the purpose of giving the brain more room, the speaker thought it just as well to let them alone, considering that it was not known whether the early closure had anything to do with the condition or not.

Dr. E. D. Fisher was in favor of an operation in the class of cases referred to by the author of the paper. As soon as the first symptoms, such as convulsions, and so on, appeared, even if this was during the first week of life, he would recommend operation, and at any time if the case was seen before degenerative changes had taken place; even then he was not sure that an operation might not do some good towards altering cell-growth and promoting improvement. Of course, if a case was diagnosticated as one of proencephalia, an operation should not be done. The speaker reported about thirty cases of hemiplegia in which the measurements of the brain showed a very appreciable diminution on the diseased side. He thought that this was conclusive evidence of the condition, and that by operation something might be done to excite nutrition and growth.

Dr. W. R. Birdsall was glad to indorse Dr. Starr's conservative views in regard to operative procedures in this class of cases. Dr. Sachs had referred to irritation of the cortical lesion, which might set up beneficial changes. The speaker thought that it could just as well bring about a worse condition of affairs. As to many of the so-called atrophies, he thought that arrest of cerebral growth might take place without a true atrophy, that the cells retained their original condition without degenerative changes taking place. He thought that many of the cases of retarded development were of this type, rather than of sclerotic atrophy. As to operating in such cases, he would like to know what operators expected to find, and when they had found something what they would do with it, and what good they could expect from such procedures. He thought that Dr. Starr's idea of a safety-valve for the purpose of giving the brain more room was far-fetched, inasmuch as the original trouble, whatever it was, caused an arrest of both brain and cranial growth. He might operate in cases of disturbance of the circulation, where the indications were clear and where the point of disease was likely to be found, but there was a great difference between operating in such cases and splitting open a microcephalic skull for the purpose of letting the brain grow.

The President had seen many operations for infantile atrophies, and had yet to see any

good come of it, and, furthermore, he could not see how benefit could be expected from surgical interference in such cases. How could an operation do any good at the time of an inflammatory attack of the brain? and how could it be of service when secondary changes had taken place? If the sclerotic area was cut out, would there not be left behind a similar condition of cicatrix and contraction? He thought that for records of cure in cases of operation for cerebral epilepsy to be of value they should not be reported too soon, for the history of some cases without treatment showed spontaneous recovery, and the attacks had not returned for years. He was satisfied that Dr. Starr was laboring under a misapprehension in thinking that premature ossification of the fontanelles induced brain-pressure, although cases of epilepsy had been reported as due to this cause. He thought that more was expected in the surgery of cerebral atrophies than would ever be realized.

DR. STARR said it was all very well to talk of operating early in these cases, as one of the speakers had proposed, but who was to make such an absolute diagnosis and to decide when and when not to carry out such serious procedures?

CREOSOTE IN SUBCUTANEOUS INJECTIONS.

As the treatment of tuberculosis to-day occupies the first place in point of importance and interest, and since creosote is a remedy whose use has been highly extolled in the treatment of this disease, it is not without interest to call attention to the characteristics which must be possessed by the specimen of creosote to render it suitable for subcutaneous employment. The characters of the officinal creosote which possess that character only in name have been made the basis of a study by DR. CHOAY, whose results are published in the *Journal de Médecine de Paris* for May 24, 1891. Officinal creosote should have a specific gravity of 1067, should be neutral to litmus-paper, giving with neutral perchloride of iron a green coloration, distilling at 200° to 210° C., and derived solely from wood-tar. Dr. Choay maintains that if the specimen of creosote gives a blue coloration with a test solution of perchloride of iron, the creosote has not been obtained from wood-tar, or has in some way deteriorated or has been adulterated. So also if its density is much above or much below 1067, or if its point of distillation varies much below 200° or 210° C., it likewise is not suited for subcutaneous employment. After detailing a number of methods as to the manufacture of creosote and the way in which it may be contaminated by foreign substances, he gives the following method for preparing a perfectly pure creosote: Taking the beechwood creosote he commences by distilling between 200° and 210° C., but as this distillation develops a small amount of phenic acid, it is necessary first to eliminate this impurity; to accomplish this he makes use of the different degrees of solubility in glycerin and water. If one adds to glycerin a creosote containing phenic acid, and then water is afterwards added, the creosote separates while the phenic acid remains in solution. It then only is necessary to separate the creosote and to distil it in a vacuum. By this process a liquid is obtained which is colorless, has an agreeable odor, resembling that of guiacol, which may be given subcutaneously when mixed with proper vehicles.

Further details as to the best formula for subcutaneous employment are promised in a subsequent communication.

ACUTE INFLAMMATION OF THE MUCOUS MEMBRANE OF THE ILEUM FROM CLIMATIC CAUSES.

At the meeting of the Royal Medical and Chirurgical Society, held June 9, 1891, DRS. GEORGE THIN and FRANK J. WETHERED describe the case of a patient who was for many years known to them as a man of strong constitution and in the enjoyment of excellent health (*British Medical Journal*, June 13, 1891). While travelling in the north of China in the autumn he became, after a chill, subject to a moderate but obstinate diarrhœa. After several months, the tendency to diarrhœa increasing, he became subject to febrile attacks, and after three months of the combined moderate fever and diarrhœa he had lost forty pounds in weight, and was sent to Europe. The condition became aggravated on his way home, his journey being broken for six weeks on account of a very acute illness, of which the leading features were diarrhœa, retching, nausea, and fever, his condition for three weeks of that time being critical. After a comparatively rapid convalescence, during which time he regained his normal weight, he enjoyed three months of good health, and appeared perfectly well. A chill brought on another acute attack, the general symptoms of which were fever, nausea, abdominal uneasiness, thirst,

entire loss of appetite, and complete incapacity to digest food. During the whole of his illness there was diarrhœa, the intestinal discharge consisting of a dark-colored fluid with an apparent absence of any fæcal element. Death took place at the end of five weeks from the seizure. A necropsy was made by Dr. Sidney Martin. The mucous membrane of the ileum presented a worm-eaten appearance along its whole course. There were superficial ulcerations not extending deeper than the mucous membrane, and in some places there were discrete erosions of the size of a split pea. The ulceration increased as it descended the ileum, and the mucous membrane seemed somewhat thickened. At the entrance of the vermiform appendix into the cæcum the mucous membrane was thickened and slightly eroded. In the whole of the large intestine there were only about ten superficial ulcers, all of which were close to the cæcum, five being grouped together, this gut being otherwise healthy. The stomach and jejunum were unaffected, and there was nothing remarkable in the liver or spleen. Dr. Wethered prepared specimens of the viscera, and on microscopical examination the authors of the paper found the following morbid appearances in the ileum: No traces of the villi were observed. Lieberkühn's crypts in the least diseased parts were not affected at their deep ends, but were indistinct towards the free edge of the mucous membrane, and lost in a finely-granular substance which covered the whole of that part of the gut. At some parts, while the epithelium of the crypts could be recognized as much altered at their deep ends, atrophy and destruction had occurred at a short distance from their base, a mucoid-looking material distending the lower part of the crypt. In some parts the whole crypt was disintegrated, its position being indicated by the broken-down remnants of the epithelial cells. At the seat of the erosions the epithelium had entirely disappeared, the free surface being covered with a layer of granular material similar to that which covered the less affected parts of the gut, and below this substance there was a thick mass of small cell infiltration in the whole of the submucous layer. The muscular and subperitoneal coats were comparatively unaffected. The mucous membrane of the large intestine, as a whole, and all the upper parts of the intestinal canal, were normal. The authors had not been able to find any record of a case of acute inflammation of the mucous membrane of the intestine limited to the ileum and involving the whole of its surface. Clinically, it was shown in the paper in what respects the symptoms differed from typhoid fever and dysentery, the two diseases in regard to which questions of differential diagnosis could arise. Special attention was called to the apparent absence of fæcal elements in the intestinal discharge, and of the suspension of the digestive functions, notwithstanding that the stomach, duodenum, jejunum, and liver were comparatively healthy. Milk and raw egg, when not rejected by vomiting, passed in the motion entirely unaltered, and it was suggested that this suspension might at least partly have been due to a reflex effect from the inflamed mucous membrane of the ileum.

THE PROPHYLAXIS AND TREATMENT OF DIPHTHERIA.

At the meeting of the American Medical Association, DR. J. LEWIS SMITH, of New York, read a paper on this subject before the Section on Diseases of Children, of which the following is an abstract (*Medical Record*, June 6, 1891):

The room should be disinfected by adding to one quart of simmering water one to two fluidounces of the following mixture:

℞ Oil of eucalyptus, ʒi;
Carbolic acid, ʒi;
Turpentine, q.s. ad. ʒvi to ʒviii.

Everything and every person not absolutely necessary for the comfort and management of the patient should be excluded from the sick-room. Physicians undoubtedly conveyed the disease. They should always examine the fauces by standing behind or at the side of the patient, so that no ejected mucus may come upon them. After each visit they should wash thoroughly, in a sublimate solution, hands, face, and beard. Walking cases without fever, anorexia, or malaise diffused the disease. Daily inspection of the fauces of school-children had been proposed. Convalescents should not mingle with healthy children for four weeks. He admitted the full claim of the Klebs-Loeffler bacillus to be the cause of the disease. It was a surface microbe, never penetrating the interior of the body, but attacking only mucous surfaces or cutaneous abrasions. It produces a ptomaïne containing carbon, hydrogen, azote, sulphur, and oxygen, which by absorption through both blood- and lymph-channels causes the

nephritis-granulo-fatty degeneration of heart-muscle and paralysis.

The treatment should embrace hygiene, diet, and alcohol. Rectal alimentation could be followed for a time. Failure of appetite rendered the outcome doubtful. Diet could embrace milk with sarco-peptones, beef-tea or meat-juice, and the various predigested compounds. Large and frequent doses of alcohol were positively necessary. It is quickly eliminated, and often will save life unless blood-poisoning has actually set in. In the proportion of one to five it has been shown to have a destructive action on the growth of the bacillus.

Locally, we should remember that normal epithelium was a barrier to the germ's entrance, and hence our remedies should be such as not to destroy the epithelial covering. Denuded or diseased surfaces were favorable starting-points for the disease. Corrosive sublimate, 1 to 8000; carbolic acid, 1 to 50; salicylic acid, 1 to 80, had proven of service in arresting the germ growth. Potassic chlorate was useless in this direction, and he had come to discard its internal employment entirely. It had undoubtedly caused nephritis in many cases. The corrosive sublimate could be given by nasal injection, gargling, and internally. Where the false membrane was very thick and tenacious, equal parts of tincture of iron and glycerin should be given three or four times a day. Loeffler himself uses a mixture of carbolic acid, alcohol, and distilled water for the mouth. Our local remedies should be penetrating. Therefore glycerin and water, never syrups and mucilages, should be our vehicles for all local applications. The officinal solution of iron chloride might be diluted three or four times for this purpose. While it undoubtedly contracted the vessels it was often painful. It congeals the muco-pus of the fauces. Carbolic acid, Monsel's solution, and glycerin could be advantageously used in this way. For nasal disinfection a saturated solution of boric acid was preferable.

For internal treatment, iron assisted the anæmic condition. Vegetable tonics, including quinine, were probably useless, as were also quinine insufflations in the oral cavity. The main reliance was to be placed on the bichloride. He was in the habit of giving a two-year old child $\frac{1}{12}$ grain every two hours; four years, $\frac{1}{10}$ grain; six years, $\frac{1}{8}$ grain; ten years, $\frac{1}{24}$ grain. His solution was made by dissolving the sublimate in alcohol and adding elixir of bismuth and pepsin. Sublimate solution, 2 grains to the pint, could be used for the nose. The mercurial should be continued at least, unless diarrhœa supervened, but not longer. Calomel had been suggested. Many gave an initial dose, and some continued it through the entire disease. It undoubtedly increased the anæmia. Of late it had been given in the New York Foundling Asylum by sublimation, from 10 to 40 grains being used, under a tent made over the patient's bed. The indications for its use was the supervention of hoarseness. The attendants had been salivated in several instances, but the patients were apparently not injured. It seemed to lessen the necessity for intubation. The process might be repeated in three or four hours. The percentage of recoveries from intubation, where necessary, was better in the calomel cases than in others. For the nephritis he gave iron, and for the paralysis tonics, strychnine, and electricity.

THE PHYSIOLOGICAL AND THERAPEUTIC ACTION OF CACTINA.

Cactina is claimed to be the proximate principle of cerium grandiflora, and has been isolated by Mr. Frederick W. Sultan, and forms the basis of a paper published by Dr. O. M. Myers in the *New York Medical Journal* for June 13, 1891.

Dr. Myers finds that locally, cactina is absolutely non-irritant, a ten per cent. solution applied to the conjunctiva producing no noticeable effect.

Therapeutic doses, in man and animals, produce an acceleration of the pulse and a rise in the arterial pressure.

Toxic doses, in animals, produce primarily an acceleration of the pulse-rate and a rise in the arterial pressure, but, secondarily, notably diminish both. The cardiac pulsations become arhythmical and finally cease, the heart being arrested in systole. The systoles, just before death, become very incomplete, probably due, as will be shown below, to a condition of superirritability of the cardiac ganglia. Death is preceded by tetanic and clonic convulsions, due to overstimulation of the motor side of the spinal cord. That the convulsions are not of cerebral origin is evident, as they occur after section of the cord in the upper cervical region. The motor nerves remain unaffected, for, after the death of the animal, galvanization produces contraction of the muscle. Cactina is therefore a powerful *motor spinal stimulant.*

In a dog, after section of the vagi, the

pulse-rate and arterial pressure were both increased by an injection of two centigrammes of the drug, and a strong faradic current, when applied to the nerve (vagus), failed to arrest the heart's action.

After section of the pneumogastrics and the sympathetics an intravenous injection of three centigrammes of cactina still maintained a decided rise in the arterial pressure and an acceleration of the pulse-rate. A fair conclusion, therefore, is that the drug produces these effects chiefly by *direct* stimulation of the intracardiac accelerator ganglion.

In the dog, after an intravenous injection of five milligrammes of cactina, the heart-rate was increased from 180 pulsations a minute to 222 a minute, and the cardiometer, indicating normally a height of 145 millimetres, showed an increase of the arterial pressure by a rise of 53 millimetres. If an animal is placed under the influence of cactina and the cardiometer applied, the blood-pressure, as before stated, will register about 198 millimetres. Now, if the spinal cord is cut high up, thereby intercepting the impulses from the medullary vaso-motor centre, the arterial pressure will instantly drop about twenty millimetres. This would indicate that the increased pressure was not wholly due to increased cardiac action, but a result of stimulation of the vaso-motor centre in the brain.

The following is the author's summary of the effects of cactina in therapeutic doses:

1. *Increases the musculo-motor energy* of the heart, probably through its influence upon the intracardiac motor and accelerator ganglia, in consequence of which the cardiac impulses become regular and much stronger.

2. Elevates the arterial tension, increasing correspondingly the height and force of the pulse wave. This is produced by—*a*, increased cardiac action; *b*, stimulation of the vaso-motor centre at the base of the brain.

3. Influences the nervous system by its direct action upon the motor centres of the spinal cord, thus increasing the reflexes and elevating the general nervous tone. Herein cactina resembles strychnine, and other points of similarity are evinced by clinical observation.

Therapeutics.—It logically follows, if conclusions as to its physiological action are correct, that in cactina we have a powerful cardiac tonic stimulant. Clinical observation teaches that its greatest value is manifest in functional disturbances of the heart, as simple dilatation and cardio-muscular atony (resulting from deficient innervation and nutrition) without organic lesions. If valvular disease exists, accompanied with dilatation, the drug would seem to be clearly indicated. In conditions of cardiac and general muscular relaxation with impaired nerve-energy, and in cases of "irritable heart," "tobacco heart," etc., the drug accomplishes excellent results; probably by (*a*) stimulation of the spinal motor-nerve centers; (*b*) constantly stimulating the heart-muscle to action and thereby increasing its nutrition and development.

A special indication for its use is during the critical periods of adynamic fevers, as it combines the elements of a heart and spinal motor stimulant.

Finally, it is stated in *Practice* for May, 1891, that, unlike digitalis, cactina may be administered continuously without fear of exciting gastric disturbance, and the objectionable cumulative action of the former drug is entirely wanting. In short, cactina may be employed with benefit in all varieties of functional cardiac and circulatory disturbances and in organic heart-disease, except in cases of *mitral stenosis*, where digitalis is to be preferred on account of its power of prolonging the diastolic period, thus affording the ventricle power and time to entirely empty itself. *Per contra*, in *aortic insufficiency*, the short diastole produced by cactina allows no time for regurgitation of blood into the ventricle; whereas, digitalis favors, by prolonging the diastolic period, just what we would seek to prevent.

CAFFEINE IN PNEUMONIA.

De Gempt (*Berlin. Klin. Woch.*) urges the use of caffeine in cases of threatened collapse in various asthenic diseases, but especially in acute pneumonia, and cites several cases in which it was successfully used in conjunction with stimulants. He believes the drug indicated in the course of acute pneumonia when there is evidence of cardiac failure, such as rapid, irregular pulse with lowered tension. Should the pneumonia be of asthenic type, it should be used from the onset, and the earlier in the course of the disease it is used after asthenia develops, the better. In cases of this sort, caffeine, in doses of .35 gramme four to five times daily, raises the arterial tension, diminishes the rate of the respiration and pulse, and lowers the temperature. Its action is prompt, but in urgent cases it had better be used hypodermically. It is advisable to continue it for a brief period after the febrile defervescence.—*Western Medical Reporter*, June, 1891.

THE ACTION OF THE INGREDIENTS OF ALOES.

It is well known that the juice of aloes is a mixture of a resinous matter, soluble in boiling water, and the substance aloin, which is, according to some, endowed with the active principle to a greater degree even than aloes, while according to others it is less active. This divergence of opinion is in great part explained by the fact that the different specimens of aloin extracted from different species of aloes are far from representing products which are at all comparable as regards their pharmacodynamics. It is evident, then, that we have here a question of pharmacology, which has, as yet, by no means been satisfactorily elucidated.

Dr. Hans Meyer has undertaken a series of researches in the Pharmacological Institute of Marbourg, with the end of contributing to our knowledge of the properties of aloins extracted from the three different varieties of aloes,—Barbadoes, Curaçoa, and Natal. His results are analyzed in the *Gazette Médicale de Paris* for May 23, 1891. According to Dr. Meyer, aloin, whether extracted from the Barbadoes, Curaçoa, or Natal aloes, is an active purgative when administered by the mouth or subcutaneously. The active dose is approximatively the same in the two cases, without doubt because in both cases the principal part of the aloes administered leaves the organism through the intestine. Even when aloin has been given subcutaneously, it is always to be found in considerable amount in the intestine, while but the merest traces of it are recognizable in the urine. When aloin is administered by the mouth, no trace of it can be found, as a rule, in the urine of man, in the dog, or in the cat. In the rabbit, on the other hand, aloin does not produce purgative effects, but develops a renal irritation, which may prove fatal even when by appropriate regimen the urine had previously been rendered alkaline. Eight to fifty hours elapse between the time when the aloin is administered and the production of purgation. It thus seems probable that the purgative effects are not produced directly by aloin, but by some derivative of aloin which originates in the intestine. Aloin is readily attacked by alkalies and metallic salts, and it consequently suggested itself to Dr. Meyer to study the action of aloin, after adding to it potassium carbonate and sulphate of iron. With the latter it appears that the purgative action of the aloin was somewhat increased. With the dog and the cat, the aloin extracted from Natal aloes, administered by the ordinary method, only produces purgative effect in very large doses, unless it is associated with alkalies, in which case it appears to possess the activity of the aloin of Barbadoes aloes. Natal aloes is inefficacious with or without the association of alkalies; to obtain purgative effects with this substance it is necessary that the subject should, for at least six days before the experiment, live exclusively on a meat diet. The resins of the different varieties of aloes, even although they contain extremely small quantities of aloin, have about the same degree of purgative power.

DEEP MEDICATION IN THE TREATMENT OF POSTERIOR URETHRAL CATARRH.

Dr. E. L. Keyes read a paper on this subject before the New York Academy of Medicine at its meeting held May 21, 1891 (*New York Medical Journal*, June 13, 1891.) Dr. R. W. Taylor, in a paper on this subject, after exhaustively reviewing the work of writers and comparing the opinions expressed upon the vexed question as to whether early radical removal of the initial lesion should or should not be resorted to, in the hope of limiting the specific action of the poison to its area of implantation, said he had now learned why efforts at radical treatment had hitherto failed. As the basis of a series of carefully-instituted observations, in which the microscopical work had been undertaken by Dr. Van Gieson, he had supplied, as specimens, portions of tissue taken from the neighborhood of various initial lesions of verified specific character, and of only a few days' development. The results of the investigations had gone to show conclusively, as would be demonstrated by the enlarged microscopic drawings which he exhibited, that, though the tissue around the chancre appeared perfectly normal, there was already widely-disseminated involvement of the subcutaneous structure. This consisted in changes in the circumvascular spaces by infiltration with small round cells, all the smaller arteries and veins over a considerable area beyond the initial lesion being thus involved. There was also in progress a process of abnormal proliferation of the endothelial cells of the vessels. From this it could be deduced beyond dispute that the infective processes were, from the period of implantation of the virus, of so rapid a character as to render utterly futile any attempts

at aborting the disease by cautery or excision of the initial lesion, however early it might be observed.

In the discussion which followed, DR. A. JACOBI said that it must be taken for granted that Dr. Taylor had adduced such evidence as proved his theory beyond argument. It was clear, then, that the secondary stage of syphilis began much sooner than was supposed. Accepting, then, the results of the investigations as scientifically correct,—and this they undoubtedly were,—the question of the early use of mercurials would seem of vital import. While he knew it was contrary to the practice of many others to begin the use of mercury in the initial stages, it had been his custom so to employ it, and with good results. Any doubts he might have had as to the propriety of this course would be now set at rest. He would like to know the author's views in this regard.

DR. TAYLOR said that, while as yet he had not given the point at issue consideration, he failed to see that the results of the investigation suggested deviation from his routine method of waiting until the constitutional developments had declared themselves before the institution of the indicated treatment.

THE PHYSIOLOGICAL ACTION OF CARBONMONOXIDE OF NICKEL.

In the *British Medical Journal* for June 13, 1891, PROFESSOR JOHN G. MCKENDRICK and MR. WILLIAM SNODGRASS, in a paper on the physiological action of carbonmonoxide of nickel, publish the following conclusions:

1. $Ni(CO)_4$ is a powerful poison when injected subcutaneously.

2. The vapor of $Ni(CO)_4$ in air, even to the extent of less than .5 per cent., is dangerous.

3. The symptoms are those of a respiratory poison, and are similar to those caused by carbonic oxide.

4. The spectrum of the blood of an animal poisoned by $Ni(CO)_4$ is that of carbonic oxide hæmoglobin, and it is not reduced by sulphide of ammonium.

5. When the substance is injected subcutaneously, it is probably in part dissociated in the tissues, as there is evidence of the existence of nickel in these tissues; but the nickel also finds its way into the blood and is found there.

6. The substance produces a remarkably prolonged fall of temperature even when given in small quantities. This may be accounted for by the hæmoglobin being prevented to a large extent from supplying the tissue with oxygen. Nico, as we may for convenience term this substance, makes it possible to give graduated doses of carbonic oxide, and thus reduce temperature by directly interfering with the respiratory exchanges occurring in the tissues. The objections to its use as an antipyretic are that, owing to its poisonous properties, it is difficult to inject it subcutaneously in sufficiently small doses, while it is not easy to obtain a solution in any menstruum in which decomposition will not take place. If a convenient method of dissolving it could be devised, $Ni(CO)_4$ might become a valuable antipyretic, the *modus operandi* of which is intelligible. We are at present experimenting in this direction.

The authors intend to continue the investigation, more especially as to (*a*) the solubility of the substance, (*b*) the quantitative effects on the gases of the blood, and (*c*) the quantitative effects on the gases of the air breathed by an animal under its influence.

DRAINAGE IN ABDOMINAL SURGERY.

DR. D. P. ALLEN, of Cleveland, in a paper with the above title read before the Section in General Surgery of the New York Academy of Medicine, considered the subject under three heads (*New York Medical Journal*, June 13, 1891).

Posterior urethritis, he said, had now become very generally recognized by specialists and its management much simplified. Still, among the profession at large there existed much ignorance and misconception on the subject. As a matter of fact, the treatment was easy and did not call for expert skill in the use of instruments. The author then elaborated carefully the salient points in the various conditions of the male urethra likely to give rise to intractable discharges, especially those morbid secretions having their origin in lesions situated in the posterior urethra, taking the ground that these latter were constantly overlooked by even the best men, and that patients suffering therefrom would wander from physician to physician without the true cause of their trouble being recognized, or at any rate without proper treatment for their condition being instituted.

Dr. Keyes detected posterior urethritis as follows: He "milked" the urethra, by press-

ure, firmly with the finger from the perineum forward and then caused the patient to urinate into two separate conical glasses. If there was posterior urethritis of mild grade, the first urinary gush would contain free pus in a quantity disproportionately great when compared with what had been milked out at the meatus by digital pressure. If the grade of posterior urethritis was high, the second urinary flow would also contain free pus. If the latter had come from a prostatic abscess or a suppurating seminal vesicle, this might be demonstrated by making the patient urinate in three parts,—one to wash the prostatic sinus, a second gush to show relatively what proportion of pus had flowed backward into the bladder, and here milking the prostate or the suspected vesicle by a finger in the rectum; then a third urinary gush to show what, if any, excess of pus or prostatic or seminal matter had been added to the urine by the rectal manipulation, a point to be settled by the microscope. Sources of pus from the bladder or from the kidney were omitted from consideration in the paper.

For the treatment of the condition there were certain substances which might be injected into the deep urethra when once the disease was recognized, which would have a direct local effect without subjecting the patient to the danger of cystitis or to any of the consequences of ordinary injections or the use of sounds, and would save him from the necessities of treatment by the knife. The instrument used by the speaker was the Keyes syringe, and with it twenty minims could be thrown in so that the injection would flow through the prostate and into the bladder without any of the fluid returning. He was in the habit of using four substances,—sulphate of thalline, glycerole of tannin, sulphate of copper, and nitrate of silver. The thalline was bland and unirritating. He made use of a solution of three to twelve per cent. in water. Of the sulphate of copper he used a ten per cent. solution in glycerin. The glycerole of tannin was too thick to use pure, and required from twenty-five to seventy-five parts of water to thin it. The nitrate of silver he used in a ten per cent. solution, though rarely employing it, especially in catarrhal cases. By the use of these four solutions the speaker emphatically stated that the greatest advantage might be obtained in cases which were properly diagnosticated as posterior urethritis. Without these remedies he should be tempted to give up the treatment of this affection, and, when they failed, he believed the mistake in diagnosis was obvious.

The speakers who discussed Dr. Keyes's paper in the main approved his methods of diagnosticating the location of the morbid process, differing with him only as to the therapeutical agents and instruments according to individual experience.

THE ACTION OF SULPHUROUS ACID ON THE ECONOMY.

The importance of a knowledge of the effects of sulphurous acid on the human organism has been of late very much increased by the frequency with which this agent is now employed for the preservation of wine and vegetables. It is known that after animals have been poisoned by breathing air impregnated with sulphurous acid, the highly irritating properties of the gas are manifested by the injected state of the blood-vessels of the mucous membrane of the respiratory tract where the sulphurous acid has come in contact with it, the blood of the viscera being found dark and coagulated. Also that animals that are not killed recover very rapidly, but after a few days show signs of bronchitis and pneumonia, and die. The subject has recently been examined by Dr. L. Pfeiffer, who in some experiments employed sulphurous acid in the form of neutral sulphite of sodium, and not in the free state, so as to avoid the caustic action. He found that both warm- and cold-blooded animals recovered very rapidly from an almost moribund condition, which showed that there must be either very rapid elimination or a chemical change into some harmless substance. Experiments instituted with the object of elucidating this point showed that 96.5 per cent. of the sulphite was eliminated by the kidneys as sulphate, the remaining 3.5 per cent. only as sulphite. When a large quantity of sulphite had been administered, it was nearly all eliminated in five hours. Dr. Pfeiffer believes that when vegetable-feeders are made to breathe air containing free sulphurous acid for some considerable time a reduction of the alkalinity of the blood is induced. In animals breathing air containing from one to three parts of sulphurous acid per thousand intense inflammation of the tracheal and bronchial mucous membrane was produced, also inflammatory foci in the tissue of the lungs, the blood in the capillaries becoming black and coagulated. Injections of a 5 per cent. solution of sulphur-

ous acid into the stomach set up very extensive and severe gastritis, not only all the coats of the stomach itself being affected, but also the superficial portions of neighboring organs, as the liver and the diaphragm, death occurring in from three to five minutes. It is suggested that this rapid and far-reaching action may be due to the disengagement of the gas by the heat of the stomach, so that it diffuses itself much more rapidly than a liquid could do. Dr. Pfeiffer finds that in some wines there is as much as eight parts of sulphurous acid, probably as bisulphide of lime, in 100,000, and that in preserved vegetables, such as are used in the army and on board ship, there is often a very appreciable quantity either free or combined with alkalies, this being especially the case with preserved asparagus.—*Lancet*, June 13, 1891.

THE CHEMISTRY AND CLINICAL VALUE OF STERILIZED MILK.

Of late years a great deal has been written upon the dangers of transmission of infection by means of milk derived from diseased animals, or improperly handled or exposed, and, as a consequence, sterilization has been regarded as a necessity; but the milk, after sterilization, has been found to be so changed in that process that of late a reaction has set in, and the question has arisen whether or not the desired immunity could not be better attained by some other means. In the *American Journal of the Medical Sciences* for June, 1891, PROFESSOR A. R. LEEDS and DR. E. P. DAVIS contribute a valuable paper as to the nature of the changes effected in milk by sterilization and the clinical value of sterilized milk.

Professor Leeds is well known as an authority on the subject of milk analysis, and his conclusions are extremely interesting and valuable. Dr. Leeds finds that raising the temperature to the boiling-point, and still more the retaining of it at that point for a lengthened period, as in sterilization, converts a considerable portion of the soluble into insoluble proteids. The effect of heat is greatest on the galactozymase,—the ferment found in raw milk, which has the power of liquefying starch; even raising milk for a moment to the boiling-point destroys this ferment action. Experiments made to contrast the behavior of sterilized milk with raw milk, when subjected to the action of rennet, acid, artificial gastric juice, and pancreatic juice, show that the casein, while not coagulated by the heat, is, nevertheless, less readily coagulated by rennet, and yields slowly to the action of pepsin and pancreatin. Moreover, a part of the lactalbumen of the milk is coagulated, although only partially so. Its effect, however, is to thicken the milk and intensify its colloidal (ropy or mucilaginous) character. The fat globules are likewise somewhat affected by the heat, and the coagulated proteid matters attach themselves to the fat globules, and probably have an influence in bringing about the difficulty with which the fat is assimilated.

Finally, milk-sugar, Dr. Leeds finds, is completely destroyed by long-continued heating, and is probably affected to a certain extent during the interval ordinarily allowed for sterilization. Dr. Leeds thus shows that sterilized milk is less readily and less perfectly digestible than raw milk, and if sterile milk is sought for, the present desideratum is to obtain it either directly from the animal or by a process not accompanied by such serious drawbacks.

Dr. Davis confirms the opinion, which has gradually gained ground, that while sterilized milk may be useful as a remedy in various bowel complaints, it is not sufficient to sustain life. If sterilized milk is desired, Dr. Leeds recommends that, after being rendered feebly alkaline with lime-water, the milk should be heated to 155° F. for six minutes; or, still better, the treatment, in alkaline solution, with pancreatin at 155°, followed, if not immediately used, by momentary heating to the boiling-point. Either of these procedures, Dr. Leeds maintains, will render milk sterile without detracting from its digestibility.

PROTEIDS OF MILK.

In the *British Medical Journal* for May 23, 1891, DR. W. R. HALLIBURTON publishes his conclusions in regard to the proteids of milk, as follows:

1. The principal proteid in milk, called "caseinogen," is precipitable by certain neutral salts, or by acetic acid, and may be most satisfactorily prepared free from impurities by a combination of these two methods.

2. The term "casein" should be restricted to the curd formed from caseinogen by the action of rennet.

3. In the classification of proteids, casein

should be grouped with other insoluble proteids like fibrin and gluten, formed by ferment activity from pre-existing more soluble proteids.

4. Caseinogen should be included in a new group made to include it and whey proteid. These proteids are very similar to the globulins, the chief difference being that their solutions are not coagulated by heat like the globulins, but only rendered opalescent. This opalescence, if the heating has not been continued too long, disappears on cooling.

5. Lactalbumen is very similar in its properties to serum albumen. Not only does it differ, however, from serum albumen in its specific rotatory power and elementary composition, as has previously been shown, but in its behavior on heat coagulation and in precipitability by certain neutral salts.

6. Caseinogen and lactalbumen are the only proteids contained in milk.

7. The proteid described as lactoglobulin does not exist; it is owing to the error of not recognizing that the two salts,—sodium chloride and magnesium sulphate,—when both present to saturation, precipitate albumen, that this proteid has been supposed to exist.

8. The proteids variously called lactoprotein, peptone, and hemi-albumose do not exist in milk. This mistake has arisen from faulty methods of analysis.

9. When milk turns sour, owing to the lactic acid fermentation, primary proteoses, chiefly protoproteose, are developed.

10. The proteid called whey proteid, which is formed during the rennet fermentation, is not of the peptone or proteose class, but should be included with caseinogen in a new class of proteids allied to the globulins.

RELATION OF THE PANCREAS TO GLYCOSURIA AND ALBUMINURIA.

At the meeting of the Académie des Sciences, held May 4, 1891, Dr. Hedon read a paper which largely tended to confirm the conclusions of Lépine, already published in previous numbers of the Gazette (*Le Progrès Médical*, May 16, 1891).

Dr. Hedon found that glycosuria invariably appeared after extirpation of the pancreas, and, although it ultimately proved fatal, it might yet, during periods of variable lengths, cease entirely. When this was the case it was then found that albuminuria was present. Similar effects also were observed when sclerosis of the pancreas was produced by means of injection into its canals of paraffin. Also diabetes insipidus might alternate with the progress of diabetes mellitus. When the progress of the disease was slow, during the periods when glycosuria was absent after extirpation of the pancreas, it was then found that sugar given with the food was completely utilized and absorbed, thus suggesting the fact that the function of the pancreas may be supplemented by some other organs.

TREATMENT OF WHOOPING-COUGH BY ATOMIZATION.

In the *Medical Record* for June 13, 1891, Dr. H. Ernest Schmid states that in the treatment of whooping-cough, no matter what may be the stage of the disease, he now relies entirely upon the use of a spray of a solution of carbolic acid, menthol, cocaine, glycerin, and cherry-laurel water in the following proportion:

℞ Acid. carbolic., grs. vi;
Menthol, four per cent. solution, ʒiv;
Cocaine, three per cent. solution, ʒiii;
Glycerin, ʒi;
Aquæ lauro-cerasi, ad ʒi.

He directs that this solution be thoroughly used by an atomizer every three hours, employing force, if necessary, and disregarding any apparent strangling upon the part of the little one during vigorous atomization. The nozzle of the instrument should be directed as far into the mouth of the patient as possible. During the struggling and sputtering and strangling some deep respirations will before long be made, and the object is accomplished. At first, of course, in most cases a violent paroxysm of coughing may result from the spraying, especially if much force has to be used with the child, but these soon cease and palpable effects are speedily noticed by the parents. The great point is to be able to impress the importance of perseverance. Dr. Schmid writes that he has seen the whooping-cough arrested by this means after one thorough spraying, coughing without the whoop still going on for a while, and perfect recovery has resulted in one and two weeks. He records several cases in detail which seem to substantiate his claims that this method is one of the most efficient yet devised, provided it be used intelligently and, if necessary, energetically.

REINFECTION OF SYPHILIS.

The important, interesting, and still open question of a second infection with syphilis is made prominent at this time by Dr. Taylor's report of two cases in the *Journal of Cutaneous and Genito-Urinary Diseases* of December, 1890, and in the same journal for June, 1891, there is an analysis of several additional cases. LABARSKI reports a case in the *Medicin. Rundschau*, 1890, of a soldier who in 1878 presented himself with a chancre which had appeared three weeks before. Secondary symptoms appeared, and a course of forty inunctions was made. The following year there were later manifestations, which, like those, disappeared under treatment. In 1880 there were tertiary lesions, and then came a period of eight years of entire freedom from symptoms. In December, 1888, a soft chancre appeared upon the penis a few days after exposure, and was followed by a suppurating bubo. This chancroid appeared to pass into an initial lesion of syphilis. In March 1889 (three months later), there was a roseola, accompanied by angina, enlargement of the glands, etc. Treatment was carried out by means of injections of corrosive sublimate, gm. 2, in oil of vaseline, gm. 60, of which a syringeful was injected once a week. (This case does not appear conclusive, for we know that in a syphilitic subject induration and incidental lesion, such as a chancroid causing it to resemble a primary sore, and a roseola and angina resembling that of secondary syphilis may appear from other causes.)

The case which Harrison Young reports, on the other hand, in the *British Medical Journal*, No. 22, November, 1889, possesses more of the requisite features to make out a strong case. Here, after an infection in 1882, with symptoms showing themselves up to 1885 and an interval of four years of freedom, a new hard chancre was contracted in 1889, accompanied by indolent adenopathy and followed by roseola, mucous patches, etc.

Ducrey's case, reported in the *Giornale Italiano delle Malattie Ven. e della Pelle*, December, 1888, concerned a woman who gave a good history of syphilis, with characteristic secondary manifestations, adenopathy, etc. After marriage patient remained well for ten years. Then the husband contracted a chancre and infected his wife. When examined she was found to have a cicatricial induration of one of the labia, general glandular enlargement, a macular syphilide over the whole body, mucous patches on the soft palate and velum, and complained of rheumatic pains. At the same time there was such evidence of her former infection as a characteristic gumma of the scalp and multiple cicatrices of an old tuberculo-ulcerative syphilide, and atrophic scars from more recent dry tubercles. Other secondary manifestations of the reinfection followed; the body became covered with a small pustular syphilide, osteocopic pains became very severe, and an iritis developed, together with ulceration of mucous patches, etc.

This case seems to fulfil the conditions regarded by Fournier as necessary to establish reinfection,—*i.e.*, characteristic secondary signs (initial lesion not noted in this case, though the late lesions seem to prove the first infection), a period of entire freedom from manifestations, a new indurated sore after coitus with a recently-infected husband showing secondary signs, and a renewal of secondary accidents.

Pospeloff (*Rev. de Cien. Med. de Barcelona*, 1890) relates the case of a patient who acquired a chancre two weeks after coitus in October, 1882. The nature of the ulcer was agreed upon by four physicians. In January there was fever and a roseola. Mercurial frictions were made. Mucous patches of the throat and lips then appeared and local treatment was instituted. In March, 1883, all signs of syphilis disappeared after mercurial friction, but in May psoriasis palmaris was noted. At the end of October (one year after infection) inguinal adenopathy alone was noted. In 1884 treatment was continued and no signs of syphilis were seen. In 1886 patient married, and the event was followed by the birth of a healthy child. In December of 1889, four weeks after impure coitus, there appeared at the root of the penis and extending upon the pubis two lesions, which Pospeloff saw in the following February and diagnosticated as true chancres. Six weeks later there appeared roseola, inguinal and cubital adenopathy, erythematous angina, and patches on the tonsils. The roseola disappeared after two months. Contrary to the views of Ricord and Sigmund, the second infection was more intense than the first. Two months after the roseola had disappeared there was some induration remaining at the site of the chancre; lenticular papules were disseminated over the internal surface of the forearms and thorax, and there were erosive papules on the lips. The observer considers these signs of syphilis in its second stage conclusive evidence of a reinfection, whose

occurrence proves the cure of the first attack.

Dr. Clatworthy relates of syphilis recurring within three years of a first attack (*Australian Med. Gaz.*, February, 1891). The first chancre appeared in January, 1888, leaving a scar and being followed by secondary symptoms, enlarged glands, mucous patches, and alopecia, but no eruption. Rheumatic pains lasted for a year. Mercury and iodide were taken for two years. In November, 1890, patient was again exposed, and in December a circular chancre was found near the site of the first, indurated and ulcerated; no accompanying glandular enlargements. A few days after the chancre had disappeared a well-marked macular eruption came out over the chest, buttocks, and thighs, and this was followed by bone pains and sore throat. The first attack was not personally observed by the reporter, and some elements of a strong case are lacking.

INTRABRONCHIAL INJECTIONS IN PULMONARY PHTHISIS.

Dr. Giulio Masini has made experiments (*Gazetta degli Ospitali*, January 7, 1891) as to the possibility of injecting medicinal substances directly into the bronchi, and has satisfied himself that it can be done. He uses for the purpose the barrel of an ordinary syringe, to the distal end of which is fixed a catheter, with the usual laryngeal curve, which can be pushed out or drawn in as may be required. The liquid used was a twenty per cent. solution of olive oil, filtered and sterilized, and creosote. This is injected into the trachea or into one or other bronchus by passing the catheter through the glottis from the mouth. Auscultation by an assistant, while the liquid is being injected, enables the operator to know whether the medicament is reaching its destination. The experiments were made in Professor Maragliano's clinic, at Genoa, on five men and one woman suffering from various degrees of pulmonary disease,—from catarrhal bronchitis with doubtful signs of tuberculosis to the gravest form of phthisis, with infiltration of both lungs, cavities, etc. In two of the cases in which on admission there were signs of disease at the apex, with night-sweats and wasting, the effect of the treatment was very remarkable. After injections of the solution every day for a month (increasing gradually in amount from one to four cubic centimetres) the physical signs disappeared "completely" in one case, and "all but completely" in the other. Both of them gained considerably in weight. In one of the remaining cases the treatment had to be discontinued almost immediately, on account of the extreme sensibility of the larynx and the indocility of the patient. In the three others, daily injections (of four, five, eight, up to ten cubic centimetres) were given during three months and a half; in two of them "a notable result" was obtained, the expectoration ceasing almost entirely, the diseased area in the lungs becoming much smaller and the patients gaining weight and feeling better. In the fourth case the disease remained stationary, but the daily amount of expectoration diminished by eighty grammes, and there was a slight gain in weight. Dr. Masini thinks these results sufficiently encouraging to warrant further trial of the method.—*Chicago Medical Recorder*, May, 1891.

THE EARLY DIAGNOSIS OF DISEASES OF THE SPINE IN CHILDREN.

It is a simple matter on paper, but not always so in actual practice, to say whether a child has or has not early vertebral ostitis. Those who have seen most of spinal disease in children will be the least likely to dispute this statement. In a doubtful case the child should at once be placed flat in bed, and kept flat until all equivocal symptoms have passed off. Many instances have occurred in which the practitioner, though suspecting the invasion of ostitis, has allowed the child to run about, because the existing symptoms were not sufficiently obvious to enable him to form a positive diagnosis. There are two methods of examining for spinal caries, which are as widely adopted as they are antiquated and unsatisfactory. The first is that of pressing upon the spinous processes from the nape of the neck downward. The disease being in the body of the vertebræ, pressure upon the tip of the spinous process is hardly likely to give trustworthy information. Often, indeed, there may be neither pain nor tenderness in the affected region. The second method is that of applying a hot sponge along the spine. Any child would be apt to wince under this test, even though its spine were healthy. On the other hand, if its spine did happen to be diseased it would by no means follow that the hot sponge would give information of that fact.

Though there is often no local pain with

spinal ostitis, there are often complaints of symmetrical peripheral pains, which are too frequently ascribed to "rheumatism" by those who do not trouble to seek out their cause.

In an interesting lecture on this subject, published in *The Medical Press and Circular* for May 27, 1891, Mr. Edward Owen calls attention to the fact that before proceeding to examine the child, it is well to question the parents as to the complaints of aches or pains, and to notice how the child holds himself. Probably he will be standing unusually straight, with his head and shoulders somewhat thrown back in order to keep himself in a position of stable equilibrium, the centre of gravity having been advanced by the collapse of the softened vertebræ. As regards pain, it may probably have been complained of in the back. But very possibly there may have been no complaint of that nature, the child having suffered only from peripheral neuralgias. These distant pains are usually symmetrical, and it is strange how the very terminal filaments of the sensory nerves are those chiefly concerned in it. Thus, in cervical caries there may be pains in each side of the neck; or, the third and fourth nerves being implicated, over the pectoral regions and shoulders. The lecturer then brought in a child, directing attention to its stiff and straight pose, and to the fact that it supported itself by holding on by his mother's dress. On being questioned, the mother said that the child's constant complaint was of "headache in the chest." Intercostal pains, which were carelessly ascribed to "pleurodynia"—whatever that was—or to "rheumatism," were often the result of vertebral disease. So also with "belly-aches," pains in the hips, thighs, legs, and feet; in the arms, elbows, and hands.

Several naked children with various spinal affections were then brought in. Attention was called to the fact that straightness of the spine in the cervical and lumbar region was as characteristic of vertebral caries as was the angular projection which so quickly appears in the case of caries of the dorsal vertebræ.

After all, stiffness was the most important sign of early spinal disease. Two boys of about the same age were placed side by side upon the floor; one of them had dorsi-lumbar disease, while the other had a sound spine. The latter could put his head between his knees, his back assuming a beautiful, convex sweep. The other boy could not bend down at all. Two children were then brought in whose projecting spinous processes offered strong suggestion of vertebral caries. Their backbones could, however, be freely bent and turned in every direction, and were manifestly destitute of inflammatory trouble. Their mothers said, moreover, that they had not complained of pains, and that they could run about and play with other children without showing unusual fatigue.

As regarded the treatment of the early stages of spinal disease, Mr. Owen summed up his advice in one word, rest—absolute and continuous rest. The child should be placed on a narrow horse-hair mattress, with the head securely steadied between very large sand-bags, only a small, flat cushion or pillow being allowed beneath the nape of the neck. When the pains had become a matter of almost "ancient history;" when it was certain that no abscess was forming, and when, with the lapse of many months, it might be considered that all tubercular inflammation—and these cases are always tubercular—had passed away, some kind of rigid support might be employed. To substitute a plaster of Paris or a poro-plastic splint, however, for absolute rest in the horizontal posture was one of the commonest errors of the present time in connection with the treatment of early spinal disease.

THE ACTION OF THE BLOOD SERUM OF THE DOG ON THE CORPUSCULAR ELEMENTS OF HUMAN BLOOD.

It is well known that transfusion of the blood from one species of animals into another is followed by disorganization of the corpuscular elements with the production of thrombosis and hæmoglobinuria. Such a result is usually attributed to the solution of the corpuscles of the transfused blood. In view of the recommendations which have lately appeared in the French medical press as to the transfusion of the serum of the blood of the dog and the goat into individuals affected with tuberculosis, it naturally becomes an important question to decide whether a similar noxious influence is exerted by the blood serum, and in this connection we would call attention to a paper published in *La France Médicale*, May 29, 1891, by Dr. Charles Luzet. It is well known that the effects of transfusion vary with the nature of the species experimented on, and with the quantity of the blood injected. It is further of interest to determine as to

whether subcutaneous injections of blood serum which do not directly come into contact with the corpuscular elements can also exert a hurtful action.

Dr. Luzet's experiments were made by mixing a drop of serum and a drop of blood on the warm stage under a microscope. His first experiment consisted in mixing a little blood of a perfectly healthy individual with the serum of a dog. Immediately on examining under the microscope it was found that the red corpuscles ran together in an irregular mass instead of ranging themselves in rouleaux, as would be naturally expected. A certain number of the red corpuscles, however, remained isolated, and on them the morphological changes produced by the blood serum could be readily followed. Almost immediately these corpuscles were found to assume the crenated form, after about three minutes an exudation appeared on the edges of these corpuscles, and after five minutes epinated corpuscles were visible and exudation had largely increased ; after five minutes no reticulum was visible, while at about the seventeenth minute the reticulum commenced to be evident in an extremely fine, open, network visible only at the border of the corpuscular mass, this fibrinous net-work being much more than normally the case. During all this time the white corpuscles had observed their amœboid activity, while at about the twentieth minute the nuclei of the white corpuscles became evident ; finally the viscidity of the corpuscles was found to be greatly increased.

In his second experiment the blood of a second healthy individual was mixed with blood serum of a dog, and here also the same morphological changes in the red corpuscles was evident and the same delay and imperfection in coagulation. His third experiment consisted in mixing the blood of a dog with blood serum under the same conditions. Here also the red corpuscles ran together to form a compact mass, and about the same general results were obtained, with the exception that the interference with coagulation was more marked and that the viscidity of the red corpuscles was much more accentuated than when the serum of the dog was allowed to act on human blood. It thus would seem from these experiments, which were confirmed by numerous others, that serum acts upon the formed elements of the blood by precipitating the hæmatoblasts and in preventing or interfering with coagulation. If the serum of a dog is allowed to act on the blood of man or the serum of human blood upon the blood of a dog, the marked corpuscular alterations which occur and the solid blood concretion point in the strongest terms to the theoretical possibility of the formation of emboli by such procedures. As it appears that these transfusions of serum have been practised to a considerable extent in France, it is remarkable that as yet we have met with no accounts of serious emboli so produced.

THE PHYSIOLOGICAL ACTION OF THE ETHEREAL EXTRACT OF MALE FERN.

The rhizome of the male fern (*Aspidium filix mas*) treated by ether in a displacement apparatus yields a brownish oleo-resin which has for a long time been employed as a vermifuge. This oleo-resin is a mixture in which filicic acid, filiceic acid, filixoide acid, filictannic acid, and filicine have been recognized. Filicic acid has been especially studied in Dorpat under the direction of Buch. While Leibig denies the tænicide properties of this acid, Carlblom claims that in this principle is found the active ingredient of the ethereal extract of male fern. Rulle, on the other hand, states that impure filicic acid or the products of the decomposition of this acid is the most efficacious. The general testimony, however, points to the conclusion that the action of this principle is less constant than that of the oleo-resin. It is well known that the fern exercises an energetic toxic action upon inferior organisms, particularly upon worms, but the nature of this action and that which it may exert upon higher organisms has not yet been satisfactorily studied. It is generally believed that in man the male fern is almost non-toxic, and extremely large doses are courageously given as a vermifuge. Nevertheless, some cases of poisoning have been reported in which phenomena of gastro-intestinal disturbance, vomiting, diarrhœa, and nervous phenomena have been reported. Thus, in a case reported in the *Medical Times and Gazette* for 1882, ingestion of the ethereal extract of male fern and pure kamala produced death at the end of one day, with the production of vomiting, diarrhœa, and muscular cramp. The ethereal extract of male fern from which the ether has been removed occurs in the form of a semifluid soluble substance soluble in ether, insoluble in water, and of a peculiar nauseating odor. In the *Revue Médicale de la Suisse Romande* for May 20, 1891, Drs. J.

PREVOST and PAUL BINET publish a series of experiments which they have made with this substance, the extract being administered in the form of an emulsion with the aid of gum-arabic, of which the followng represent their conclusions :

1. In warm-blooded animals and in man administration by the stomach rarely produces phenomena of poisoning on account of the extreme slowness of absorption.

2. As a consequence of hypodermic or, above all, of intraperitoneal injections of emulsions of the male fern, symptoms may be produced which may lead to death by paralysis of the heart and respiration.

3. The dominant symptom is paralysis and rigidity of different muscles, the several muscles of the heart, and the intestine, preceded by general symptoms, such as vomiting, dyspnœa, trembling, and chills. The affection of the respiratory muscles leads to the production of interference of respiration, which may prove so serious as to produce death. Paralysis of the heart, however, where the poisoning is sufficiently severe to prove fatal, is usually the cause of death. In such cases, when examined post mortem, the heart is found firmly contracted and non-irritable. The pneumogastric nerve, however, does not lose its power of stopping the heart until the final stage in poisoning. The intestinal peristaltic movements are almost entirely suppressed in the rabbit, cat, guinea-pig, and the pigeon. The direct application of the extract to the conjunctival sac of the rabbit or cat reduces and may even entirely suppress sensibility of the cornea without any constant modification in the size of the pupil, this action thus closely resembling the action of cocaine. No other reduction of sensibility has, however, been noted as the result of application of this substance in other regions than the cornea.

4. The urine is usually reduced in amount after the administration of the extract.

5. The central nervous system, which is only secondarily affected in warm-blooded animals, is rapidly paralyzed in the frog, in whom paralysis of the spinal cord and then of the nerve trunks complicate the phenomena of rigidity and loss of power of the muscles.

6. Leeches immersed in a gum-arabic-solution emulsion of the extract of male fern also present phenomena of paralysis and rigidity.

7. The oxidizing action of protoplasm on the tincture of guiac is prevented by the addition of the extract of male fern.

CANTHARIDIN IN TUBERCULOSIS.

DR. FORLANINI, of Turin (*Gazetta Med. Lombarda*, May 9, 1891) (*British Med. Journal*, May 30, 1891), has tried Liebreich's treatment of tuberculosis by cantharidinate of potassium in five cases (three of phthisis, one of pleurisy,—probably tuberculous,—and one of croupous pneumonia. In two cases the treatment had produced no appreciable results up to the date of report. Of the remaining three, in one (a woman suffering from phthisis) the injection of 2 decimilligrammes caused general and local reaction, the development of a new zone of dulness, and increase of *râles*. In a second (tuberculous pleurisy) the patient had already been treated with tuberculin without result. After the first injection of 2 decimilligrammes of cantharidinate of potassium general and local reaction occurred ; the temperature rose, and reaccumulation of effusion, which some days before had been removed by thoracocentesis, took place. After the subsequent injections the fever subsided and the effusion greatly diminished. In the third case (croupous pneumonia extremely slow in resolution) crisis had occurred eight days previously ; the injections were followed by a moderate degree of fever, decrease in the area of dulness, and abundant crepitus redux. Forlanini concludes that, contrary to Liebreich's statement, injections of cantharidin are followed by a certain amount of both general and local reaction analogous to that which follows the use of tuberculin. In all three cases the injections caused slight albuminuria and urobilinuria.

DR. ERNEST GERMONIG, of Trieste, reports (*Lo Sperimentale*, May 15, 1891) the results of the cantharidin treatment in ten cases. In eight of these the patients were suffering from pulmonary and laryngeal tuberculosis, in one from lupus and pulmonary tuberculosis, and in one from "chronic hypertrophic laryngitis." In all these cases, with one exception, bacilli were found in the sputum. All the patients complained of intense pain at the time of injection ; in some cases this lasted for one or two days. In a few instances cantharidinate of sodium, recommended by Lublinski as being less painful than Liebreich's original preparation, was employed. The injections, as a rule, were given on two successive days, the dose being 1 decimilligramme on the first occasion and 2 on the second. In two cases the injections were given on five successive days, beginning with $\frac{1}{10}$ of a milligramme, and rising gradu-

ally to 1 decimilligramme. No reaction was observed at the site of injection. In six cases some urinary trouble (strangury, traces of blood in the urine, and in three instances albuminuria without casts) was caused by the treatment. These symptoms lasted from two hours to a couple of days. A few drops of tincture of opium relieved the straining and smarting during micturition. The largest number of injections in any one case was eighteen, the least two, excluding one case in which a trace of albumen appeared after the first injection. In all the cases except two the laryngeal lesions were slight, and considerable improvement was observed in voice and deglutition, and also in the laryngoscopic appearances. In the other two cases fever was present before treatment was begun. The injections seemed to have no particular effect on the fever, nor did it produce any amelioration of the pulmonary symptoms, excepting that on the days of injection the expectoration was more abundant and more mucous in character. In one of them (a man, aged 32, with dulness and fine crepitation at one apex, "enormous" thickening of the epiglottis, and redness, swelling, and ulceration of the arytenoid cartilages) after three injections swallowing was so much easier that solid food could be taken, the voice was less hoarse, and the epiglottis was so much reduced in size that the interior of the larynx could be seen; after eighteen injections it was smaller by one-third, and an ulcer on its upper surface as well as one on the left arytenoid cartilage had healed after two applications of lactic acid; the redness and swelling had almost disappeared, and the voice was comparatively clear. There was no improvement, however, in the condition of the lung, the fever persisted and the patient had slightly lost weight, and thought he was becoming weaker. In the other case (a woman, aged 20, suffering from "hypertrophic laryngitis") the voice had been lost for six months, and there was marked thickening and redness of the vocal cords, which presented warty excrescences in the vicinity of the vocal processes. After ten injections the voice became perfectly clear, and the thickening and redness of the cords, together with the warty excrescences, had disappeared. From this experience Germonig draws the following conclusions: (1) Cantharidin is harmless and can be used even in out-patients if a watch can be kept on the urine and the dose of 2 decimilligrammes is never exceeded. (2) Doses of 1 decimilligramme do not cause albuminuria or other urinary trouble. (3) Doses of 1 decimilligramme are sufficient to produce satisfactory results if administered two days successively. (4) After injections have been given on two successive days an interval of at least one day should be allowed before another injection is given. (5) In cases of simple inflammation and tuberculous infiltration of the larynx cantharidin causes an exudation of serum which is quickly reabsorbed, with the result that the infiltration is diminished, the voice becomes less hoarse, and swallowing is less difficult. (6) Under the treatment tuberculous ulcers show a tendency to heal. (7) The remedy can take the place of curetting, which is less easy of performance and more painful to the patient. (8) No other remedy produces so rapid a diminution of tuberculous infiltration of the larynx. (9) The cantharidin treatment may be advantageously combined with the application of lactic acid. (10) It has no effect on the tuberculous process in the lungs; it neither sets up nor reduces fever, and it has no effect on the number, shape, or color of the bacilli. (11) It is contraindicated in cases where albuminuria is present. In the case of lupus the treatment produced no effect whatever. With one exception no rise of temperature or other sign of general reaction followed the injection.

HEADACHES IN CHILDHOOD.

JULES SIMON (*Gaz. des Hôp.*, Nos. 36 and 37; *Rev. des Mal. de l'Enf.*, May, 1891) recognizes seven different groups of headaches:

1. *The Headaches of Growth.*—They are frontal, exaggerated by work, coincident with pains of the joints, periosteum and cardiac hypertrophy. Treatment: Muscular rest, tonics, good food, phosphate of lime, beer, and malt.

2. *Headaches from Mental Strain.*—The children are either very intelligent and excitable, working very hard; or, on the contrary, they are those of late mental development, who have difficulty in pursuing their studies. Treatment: In the first class of cases, cessation of mental work, physical exercise of all descriptions, without fatigue and hydrotherapy. In the second class, a moderate amount of mental and physical exercise.

3. *Headaches from Digestive Disturbances.*—In children who eat too often, or too much, or too rapidly; appearing in from one to

three hours after a meal. Treatment: Strict regulation of diet; one of the bitter tonics before meals, warm drinks after meals; treat the constipation.

4. *Nervous Headaches.*—This form is easily recognized; it includes the headaches of those that are irritated by their surroundings, persons as well as circumstances, our future neurasthenics, epileptics, or hysterics. Treatment: Short douches, exercise, massage, valerian, aconite, and antipyrin for the hysterical patients; belladonna and the bromides for the epileptics. Avoid colds.

5. *Rheumatic or Gouty Headaches.*—These are sometimes accompanied by intense congestive phenomena simulating meningitis. They are recognized by their hereditary antecedents, by being associated with other pains,—neuralgias, arthralgias, myalgias; the urine contains a great quantity of phosphates, oxalates, and urates. Treatment: Moderate feeding, exercise in the open air, Russian baths and rubbing; laxatives; alkalies; salicylate of sodium in doses of from .25 to .30; tincture of colchicum, gtt. 10 to 15 daily.

6. *Headaches of Anæmia and Intoxication.*—In the first instance as the result of lack of fresh air, bad hygiene; in the second, by malaria, carbon monoxide, excessive medication (iodine, opium, digitalis, belladonna). Treatment: Remove the cause.

7. *Headaches Produced by Lesions of the Nerves of Special Sense.*—In the eyes, chronic conjunctivitis and keratitis, to be treated locally and with large doses of quinine; troubles of refraction, like hypermetropia and astigmatism, to be relieved by proper glasses. In the nose, polyps, hypetrophy of the turbinated bones, to be treated locally. In the ear, adenoid vegetations, otitis, foreign bodies in the external auditory meatus.—*Journal of the Medical College of Ohio*, June 1891.

PILOCARPINE IN ŒDEMA OF THE GLOTTIS.

In *La Médecine Hypodermique*, May, 1891, Dr. Suarez de Mendoza writes that in November, 1890, he was called in haste by one of his colleagues to examine the larynx of a young man suffering from œdema of the glottis and apparently at the point of suffocation. The situation was critical, and tracheotomy was under consideration, when on laryngoscopic examination it was noted that a small opening appeared between the œdematous tumors on each side of the larynx which became marked during respiration. The author, thinking that the case did not call for immediate surgical interference, proposed the employment of pilocarpine, which had already in his hands proved successful in two analogous cases. Accordingly three injections, amounting to $\frac{1}{25}$ grain of pilocarpine, were injected at intervals of twenty minutes. After the first injection improvement was visible, and one-quarter of an hour after the third injection all dangerous symptoms had disappeared.

THE CHANGES IN HEALTHY ARTERIES AND IN TENDON LIGATURES DURING THE FIRST FOUR WEEKS AFTER LIGATION.

At the meeting of the Royal Medical and Chirurgical Society, held May 26, 1891, Dr. Sheridan Delépine and Mr. C. T. Dent read a paper on the "Changes observed in Healthy Arteries and in Tendon Ligatures during the First Four Weeks after Ligation" (*Lancet*, May 30, 1891). The authors first explained the origin of the paper. They gave a detailed account of the state of healthy arteries five, nine, thirteen, seventeen, twenty, and twenty-three days after ligation in their continuity. They summed up these results as follows: 1. (*a*) When a healthy artery was tightly tied in its continuity and the ligature was sufficiently applied, a permanent obstruction was invariably obtained, whether a clot formed or not, and whether the point of ligation was near a collateral branch or not. (*b*) Up to the fifth day the proximal end of the occluded artery was gradually filled up with coagulated blood, which, by the fifth day, formed a plug composed of clots of various ages. Through the unequal shrinking of the various clots channels were produced, chiefly at the periphery of the thrombus, and into the crevices thus formed fresh blood penetrated. Thus a "spurious circulation" was established. (*c*) From the fifth to the thirteenth day the proliferating elements of the intima penetrated into the sides of the clot and bridged over its surface. By the thirteenth day tracts of young fibrous tissue extended all through the clot, and a thick layer of flattened cells, continuous with the intima, covered the proximal surface of the clot. (*d*) The remains of the clot were gradually absorbed, and by the thirteenth day only a few scattered masses of pigment indicated the previous existence of the thrombus. As the absorption went on the plug shrank, and ultimately its surface became concave. (*e*) While

these changes were going on within the vessel, similar processes occurred in the exudation surrounding the ligature outside the artery. Embryonic vessels formed in this region as well as in the artery. At first these embryonic vessels were simply solid columns or tracts of spindle cell, and were, therefore, only "potential vessels." (*f*) By the twenty-third day both the extraarterial and intraarterial new vessels began to extend through the degenerated muscularis close to the seat of the ligature. Inosculation of the new vessels took place, followed by canalization, and thus true circulation was able to take place through the new set of true vessels. (*g*) The ligature during the whole of this time underwent slow absorption, and was gradually replaced by young connective tissue. 2. From these results the following inferences were drawn: (*a*) That tight ligation of healthy arteries resulted in sound and permanent obstruction within two weeks; (*b*) that tight ligation with flat tendon ligature did not injure the fibrous coat of the artery, even though it were applied with sufficient force to cause complete rupture of both internal coats; (*c*) that the obstruction of the vessels by young fibrous tissue, replacing the clot, was complete long before the flat tendon ligature showed any sign of being absorbed or of giving way. 3. (*a*) The use of tendon was advocated, because this material was very uniform in structure and because the shape presented certain advantages; (*b*) tight ligation was advisable, because it gave results which were constant, and which were speedily and with certainty obtained. 4. The use of the loose ligature was deprecated, and in criticising that method allusion was chiefly made to Messrs. Ballance and Edmunds's paper, on account of its being one of the most recent and important contributions to the subject. Loose ligation should be avoided because (*a*) the method did not give constant results; (*b*) it did not give the same results as tight ligation within the same time; (*c*) it did not offer any advantages whatever as regards the operative procedure, and, if anything, was more troublesome to carry out than the recognized method. 5. In conclusion, the authors discussed the question briefly from the clinical point of view, and stated their conviction that the results of their investigation were supported by practical experience. They considered that tight ligation was the method least likely to lead to injurious consequences to the ligatured vessel, and most likely to bring about the effects which it was commonly desired to obtain by the operation.

The PRESIDENT said that he had devoted a good deal of thought to this subject, at which he had also worked practically, though not by modern microscopical methods. He had come to the conclusion that it was safer and easier for the surgeon, as well as more prudent for the patient, to have the vessel tied with such an amount of force as to divide its inner coat. This incurred no extra danger, and one was sure of producing a permanent obliteration of the lumen of the vessel. In the history of many of the cases of arterial ligature which had done badly, the cause was found to be due to a too early establishment of free circulation through the weakened vessel; the danger was a practical one, and was greater than the theoretical benefit from the avoidance of rupture of the internal coat. John Hunter, when he first tied an artery in St. George's Hospital nearly one hundred and thirty years ago, used three or four flat tapes in order to obliterate the vessel without division, and some surgeons at the present day were inclined to imitate this loose ligature. He thought that at the present time a sufficient amount of practical evidence had been collected to say that those surgeons who had used the tight ligatures had not been less successful than those who had employed the occlusion method.

MR. MACNAMARA agreed that the tight ligature gave the greatest chance of recovery to the patient. He had ligatured the common carotid, the external iliac, and the common femoral recently with a good result. He used silk ligatures which had been previously boiled in carbolic acid. The tissues around the artery were disturbed as little as possible in the application of the ligature; no blood-clot was left in the wound, deep sutures as well as superficial were inserted, and the part was kept at rest for a considerable time afterwards. Silk was as safe or safer than tendon, for there was no chance of the ligature expanding or giving way. He objected to the chromicized ligature, which remained for a long time in the wound, and, on the whole, his experience of it was not favorable.

MR. BALLANCE, after complimenting the authors on their elaborate and careful paper, said that he had studied the subject for many years, and had performed a very large number of experiments. The minute changes which had been described were identical with those which he had found, and which he had narrated in his lectures at the Royal Col-

lege of Surgeons. After one hundred and thirty-two days a tendon ligature was not entirely absorbed in the region of the knot. Encapsulation of the ligature invariably occurred in aseptic wounds, and, though an antecedent to absorption, was no bar to it. The multiplication of the endothelium he regarded as due to an alteration of nutrition. He hoped that the profession would suspend their judgment on this question till the whole of the recent work of himself and Dr. Edmunds was before them.

Mr. Spencer Watson said that the experiments which had been narrated had been performed on healthy arteries; but surgeons were often called on to deal with atheromatous vessels, when perhaps a loose ligature would be safer.

Dr. Delépine, in reply, said that the experiments of Mr. Ballance and Dr. Edmunds had been taken as a type of the action of the loose ligature. The experiments described in the paper were opposed to these, and he held that they proved the points which had been laid down.

Mr. Dent, in reply, said that the tendon remaining in the wound a long time was not an objection to its use. It was smoother and more homogeneous than silk, and was, therefore, better suited for the purpose of ligature. His conclusions were not drawn merely from the six experiments related: he had worked at the subject for a number of years, and had given an attentive study to all that had been published. By the term "loose ligature" he understood one which approximated the walls and occluded the lumen of the vessel without rupture of the inner coat. The experiments of Jones, which had been referred to, were not to be compared with those under discussion, for they were probably septic ligatures used in a wound which was allowed to become septic also.

EMPLOYMENT OF EXALGINE (METHYL-ACETANILIDE) IN INFANTILE THERAPEUTICS.

In the *Bulletin Général de Thérapeutique* for May 30, 1891, Dr. Moncorvo publishes notes of twenty-one different cases occurring in children where exalgine was employed, of which the following represents a *résumé* of his observations:

1. The marked activity of exalgine as an analgesic has been well demonstrated in twenty-one different children varying from 1 to 12 years of age, in whom it was administered in various painful affections.

2. In all the children the medicine was without exception well borne.

3. None of the complications, such as ringing of the ears, nausea, and dizziness, sometimes stated to have been observed in adults as a consequence of exalgine, were noted.

4. Exalgine was employed at first in the dose of ¾ grain daily, gradually increasing up to 5 grains.

5. Since the dose of exalgine is not disagreeable to the taste, it was given to most of his patients in substances applied directly on the tongue, while in some it was suspended in diluted wine.

6. All things being equal, the writer states that exalgine exceeds antipyrin in activity, and the same effects may be expected from it as might be looked for from a dose of antipyrin five times as large.

7. The author believes that the facts related in his report warrant the use of this analgesic in infantile therapeutics. One case of chorea, which was improved under the use of exalgine, points to the possible importance of this remedy in this disease.

CANTHARIDIN IN GRANULAR LIDS.

Dr. Juan S. Fernandez, of Havana, reports (*Progreso Medico*, May, 1891) five cases of granular lids in which he tried injections of cantharidinate of potassium. He was induced to do this by the fact that, in a case of tuberculous laryngitis treated by Liebreich, the patient had been under the care of Dr. Gutmann for granular lids since 1887. Treatment of one kind or another had been tried with little or no effect till during the administration of cantharidinate of potassium by Liebreich for the laryngeal disease, it was observed that considerable improvement was taking place in the ocular condition. The following is a summary of Dr. Fernandez's cases: 1. Man, aged 43, under treatment since September, 1889; the actual cautery had been applied to the left eye, and this had been followed by applications of sulphate of copper, nitrate of silver, sulphate of cadmium, and iodide of silver to both eyes; in spite of this, the granulations persisted. The cantharidin treatment was begun with a dose of ¼ of a decimilligramme, and at intervals of one day the dose was increased till, on the eighth day, 1 decimilligramme was reached. At this stage the patient became slightly feverish, and the treatment was discontinued for a time. The conjunctivæ were a trifle

paler, but there was no marked improvement otherwise. 2. A mulatto girl, aged 15, was treated in exactly the same way, but on the twelfth day the treatment had to be abandoned on account of the patient's timidity; the conjunctivæ were decidedly smoother than before. 3. A man, aged 32, with an acute granular condition of the lids and suppurative keratitis, was treated in the same way, but declined to go on with the injections on account of the pain which they caused. 4. A girl, aged 11; after the second injection the conjunctivæ were less injected, and had a healthier appearance; the treatment is being continued. 5. A very severe and old-standing case, with large granulations and opacities in both corneæ. After several injections the appearance of the conjunctivæ markedly improved; there was much less injection, and the surface was smoother. Dr. Fernandez thinks these results, though not brilliant, show that the treatment is, on the whole, worth trying.—*British Medical Journal*, May 30, 1891.

A LESSON IN ANTISEPTIC SURGERY.

On May 22, 1891, Sir Joseph Lister delivered the Cameron Lecture in Edinburgh, of which the following is an abstract (*Medical Press and Circular*, May 27, 1891): At the commencement of his address Sir Joseph announced that it would take the form of a lesson in antiseptic surgery, one that had been learned by him from bitter experience. In the sectional paper on this subject at the International Medical Congress at Berlin, he had expressed his belief that microbes, in the very attenuated condition in which they are present in the atmosphere, are not a source of danger, and that consequently all washing and irrigation of wounds might be abandoned if we could devise any perfect means of avoiding other methods of introduction of micro-organisms, and also of irritation by chemical antiseptics. Acting on the theory that the organisms present in air as atmospheric dust might be disregarded, he had since carried out that proposal in actual practice. The first case succeeded, and for a while all went well. In that case he tied the external iliac artery, and the peritoneum was drawn aside for a considerable distance, but no vessels of any size were cut. No antiseptics whatever were used to correct the admission of atmospheric dust, yet the wound healed without complication, and remained aseptic throughout. The next case, however, that of a woman with scirrhus of the mamma involving the auxillary glands, had a very different result. On the day after operation there was a copious discharge of serum and blood. On the second and third days the discharge continued, the temperature rose, the wound was throbbing, and red at the edges. It was evident that something had gone wrong. The discharge went on, the wound gaped, and erysipelas developed, which spread gradually over the trunk and limbs. The attack of erysipelas proved severe, chronic, and recurrent, but at length the patient was regarded as convalescent. Soon afterwards, however, a bedsore developed and the patient eventually succumbed. Death in this case was no doubt indirectly due to the erysipelas. He had seen no case of that disease starting in his wards for the last twelve years. Four days before the second operation a young man presented himself with an erysipelas of the face which he had acquired outside after an operation for necrosis of the lower jaw. He could not be refused admission, and there was no other accommodation available than the general ward, into which he was accordingly admitted. Special precautions were taken as to his nursing. The question arose, Could the fact of these two cases existing at the same time in the wards be something more than a mere coincidence? Might it not have been transmitted from one to the other? Further inquiry revealed the true state of affairs. It appeared that the sister in special charge of the case, who was well trained in antiseptic requirements, had been replaced by another, who had lately come from another institution where, as she expressed it, "they were not so strict in antiseptic surgery as we were." Further, the charge nurse had been transferred to night duty. Coming to the operation, it transpired that the nurse in special charge of the erysipelas case had actually handed the sponges to him which were used in the operation of the scirrhus of the breast. No blame was to be attached to that particular nurse. She was simply not sufficiently alive to the stern necessities of antiseptic surgery. There had therefore been ample opportunity of transferring the poison of erysipelas to the operation wound. To this sad picture there was fortunately a bright side,—namely, that although the woman was in the general wards, the disease had not spread. Special precautions were taken. The bed was placed next the door, the case was dressed last, and the dresser had to wash his hands in what was called the "strong" lotion. That

was a solution of one part of corrosive sublimate in five hundred of one to twenty carbolic solution. The two substances promoted one another's action, and constituted a potent germicide. It was pleasant to contrast this absence of extension with the experience of the old days, when the dressers went from one case to another often without even washing their hands. The discharge from the infected wound was found to be full of streptococci. Some of this matter was placed in sterilized tubes and handed over to Professor Crookshank, of King's College, for the purpose of making certain germicidal experiments as regards the lotions used.

Many previous experiments in that direction have been vitiated by the fact that in the transference of the material to be experimented on to the cultivation fluid, a small quantity of the corrosive sublimate has been transferred along with it, and the development of cultures has been thereby inhibited. Corrosive sublimate can be got rid of by ammonium sulphide. A sufficient quantity is added to combine with the corrosive sublimate and render it an absolutely inert sulphide of mercury. Professor Crookshank exposed some of the streptococcus for one, for five, and for fifteen minutes, to perchloride solution, and then added ammonium sulphide to render the mercury compound inert. The streptococci thus treated was planted in a sterilized cultivation medium of bouillon. That was nine days since, and the tubes now exhibited showed no sign of growth. That is to say, a solution of one part in four thousand of corrosive sublimate acting for one minute on the streptococcus of erysipelas had absolutely deprived it of vitality. Irrigation, therefore, would have destroyed the streptococcus in the wound. Still, irrigation is a troublesome complication that can, under certain conditions, be safely dispensed with. Considering the many ways in which septic material might be communicated, washing the wound with an efficient antiseptic lotion must be regarded as a necessity. It was our duty, concluded the lecturer, to learn from our mistakes, even when they involved so mournful a history as the present.

THE POINT OF SELECTION IN PARACENTESIS OF THE ABDOMEN.

Paracentesis of the abdomen is one of the most common, as it is one of the most ancient, of surgical procedures. The technique of its performance is based upon well-established principles, known to every practitioner, but there is still some difference of opinion as to the place best adapted for the puncture. Some surgical authorities recommend the median line as most suitable for paracentesis, while others express a preference for Monro's point of selection, which is a point situated in the centre of a line drawn from the umbilicus to the anterior superior spinous process of the ilium. Aside from the possibility of wounding the intestines or bladder, the chief danger in this operation is injury to the epigastric artery, and it has been claimed that this accident may be prevented by making the puncture at the spot selected by Monro. That this claim is not well founded is evidenced by a case recently reported by Dr. Frzebicky in the *Archiv für Klinische Chirurgie* (*International Journal of Surgery*, May, 1861), where a paracentesis performed at the latter place for an inoperable ovarian cyst was attended by so profuse a hemorrhage from the epigastric artery that it proved well-nigh fatal. This accident led the doctor to investigate the subject, and as the result of numerous experiments on the cadaver, he arrived at some conclusions which are of practical interest, both to the surgeon and physician. The investigations, which were carried out with unusual care, demonstrate the fact that, on anatomical grounds, the linea alba is the most suitable place for paracentesis, provided, of course, that no contraindication, such as adherent intestines, exists. By performing the operation in the median line, all danger of wounding important parts is avoided, although the puncture should not be made too close to the symphysis pubis to prevent injury of the bladder. It is also necessary to keep exactly in the middle since, in rare instances, a large branch of the epigastric artery passes along the side of the linea alba, injury of which may prove fatal. Although in the majority of cases, where the puncture is made at Monro's point of selection, the artery or its branches are not exposed to injury, there is a considerable minority where this accident is liable to arise. If, for some reason or other, paracentesis cannot be practised in the median line, the author recommends us to select the outer half of a line drawn from the umbilicus to the anterior superior spinous process of the ilium.

If the artery is injured by the trocar, it may be compressed by packing the wound with iodoform gauze, but if the bleeding is at all profuse, no time should be lost in ligating the vessel. Hence the author judi-

ciously suggests that, in cases where the puncture is made outside the linea alba, the surgeon should always be provided with the instruments necessary for ligation. In the absence of instruments and assistance, compression of the iliac artery may be tried, although it is frequently difficult to accomplish this procedure in a satisfactory manner.

CHLORIDE OF GOLD AND SODIUM IN DIABETES MELLITUS.

DR. J. A. ROBINSON reports two cases of diabetes mellitus treated with chloride of gold and sodium, as follows (*Chicago Medical Recorder*, May, 1891):

CASE I.—L. T., aged 52; a commercial traveller; married; no hereditary or specific disease, but a steady, moderate drinker and gourmand; weight, two hundred and three pounds; height, five feet eleven inches. Health has been good with the exception of occasional attacks of colic. One year ago he noticed he had to urinate very frequently, arising from six to ten times each night, and passing about three quarts daily.

Urinalysis.—Urine, color rain-water; specific gravity 1040; sugar by Haines's test.

Treatment.—Anti-diabetic diet, Budai Imperial wine, and five minims of chloride of gold solution, representing a dose of $\frac{1}{30}$ grain three times daily, gradually increasing dose until physiological action appears.

Repeated urinalysis during a period of eight weeks demonstrated a steady decrease of sugar until it became normal, and has remained so to date. Specific gravity 1019.

CASE II.—Mrs. F., aged 50; Irish widow; height, five feet one inch; weight, one hundred and ninety-nine pounds. A rheumatic subject. Has undoubtedly had diabetes mellitus for ten years, but a urinalysis was never made until four months ago.

Urinalysis.—Color clear; odor sugary; specific gravity 1038; Haines's test; urinates from six to ten times a night; severe pruritus vulvæ; has excruciating pain in left heel, and ankles swollen at night.

Treatment.—Dietetic, no wine, and codeina, antipyrin, Cleman's solution of bromide of arsenic, et cætera, ad nauseam. A few weeks ago began chloride of gold and sodium treatment. Through a misunderstanding the patient took the salt in such rapidly-increasing doses, and for so long a period, that she was salivated. At length she sent me a specimen of urine, and it was free from sugar; specific gravity 1020; no polydipsia or polyuria. To date no reappearance of sugar in urine in either case.

EFFECTS OF SODIUM CHLORIDE BATHS.

M. ROBIN (*Bull. de l'Académie de Médecine*, No. 20, May 25) contributes a long paper on the use of brine baths, in which he attempts to systematize their use according to results obtained by chemical examination of the urine. According to M. Robin, these baths are indicated chiefly in three conditions,—1, all morbid conditions in which there is diminished nitrogenous excretion,—that is, diminution of nitrogenous exchange in the tissues; 2, lessening of nitrogenous oxidation constitutes the second indication; 3, the third indication depends on a special action of the treatment on the waste in tissues rich in phosphorus, or in those rich both in phosphorus and nitrogen. These are the three broad indications, but experience has shown him that the baths act differently according to their degree of concentration. Thus, it is found that a quarter-strength bath is most useful in cases in which it is not desired to increase either nitrogenous exchange or oxidation, in patients with a tendency to get thin, and who excrete an excess of uric acid. It will have little effect on chronic osseous affections. Half-strength baths will be applicable to cases with diminished nitrogenous exchange. They will be useful in all chronic glandular affections, strumous disease, periostitis, and chronic arthritis. Full-strength baths have a powerful effect on organic oxidation, and will suit patients with osseous affections, rickets, certain neuroses, certain forms of anæmia, and those who are being poisoned with the products of their own imperfect oxidation. They favor assimilation while diminishing the nitrogenous output. To recapitulate, saline bathing is recommended as the treatment for the lymphatic diathesis, scrofula, and its osteo-articular manifestations, rickets, chronic uterine inflammation, chronic rheumatism, some forms of anæmia, etc. Chemical observations also tend to show that it diminishes the production of uric acid, and that it is also a means of oxidizing imperfectly burned and toxic residues. M. Robin goes further, and declares that the degree of concentration must be very carefully regulated to fulfil these various indications. Applying this to particular cases, he considers at some length the use of the treatment in anæmia. He divides anæmic patients into two classes, the first comprising those with diminished nitrogenous

exchange and lessened oxidation, the second including those in whom nitrogenous exchange and oxidation are increased. The first class is amenable to treatment by iron, which increases tissue-change, while others are more benefited by the use of arsenic, or of the salt bath, which control these processes. The same considerations are applicable to other morbid conditions, such as obesity, gout, etc. The baths, with their power of raising the "coefficient of oxidation," will benefit those who are obese from failure of disassimilation, but it will have no effect on the obesity caused by too rapid assimilation. As regards gout, the strong baths are found to be unsuitable to the confirmed disease, and are only applicable when the lesions have become passive and have ceased to increase. This is explained by the observation that the urine in acute gout presents the type of excessive nutrition, while that of the chronic affection corresponds to the type of retarded nutrition. In the latter case the baths will act by increasing the nutritive activity, stimulating oxidation, and favoring the elimination of uric acid. Lastly, the oxidizing power of salt baths justifies their employment in certain auto-intoxications of intestinal origin, and in certain cases of neurasthenia and nervous troubles consecutive to acute febrile diseases. In short, in conditions in which there is impaired nutrition from imperfect assimilation, the saline baths should be efficacious; on the other hand, if the morbid condition arises from too active absorption or oxidation, the treatment will only have the effect of diminishing still further the resistance of the organism, and of playing into the hands of the disease.—*British Medical Journal*, June 6, 1891.

TREATMENT OF LEG ULCERS.

In *La Pratique Médicale* for May 27, 1891, DR. GUNTHER recommends a method of treatment which he claims has in his hands yielded the most satisfactory results. The first indication in his practice is to produce an aseptic condition of the ulcer, which is accomplished by first washing the ulcer with some antiseptic solution and then powdering it with a mixture of equal parts of salol and pure talc. The second indication, that of improving the nutrition of the surrounding parts so as to produce softening of the callous borders of the ulcer, and suppression of blood and lymphatic stasis, is accomplished by means of massage of the surrounding parts, and in the intervals by the application of wet compresses covered with rubber cloth so as to keep the parts in a permanent bath of moisture. After each *séance* with massage the borders of the ulcer are subjected to light percussion or tapping by means of a percussion hammer. The author states that after about fifteen days the callous borders of the ulcer have become softened, and the ulcer is by this time transformed into a simple wound and is in active process of cicatrization. If the ulcer connects with subcutaneous sinuses, as may be readily recognized by the sensibility in the border of the ulcer to pressure, these sinuses are opened by incision and subjected likewise to disinfection; when thus the ulcer is once transformed into a simple benign wound cure is accelerated by simple compression by means of adhesive plasters.

UNCONTROLLABLE VOMITING OF PREGNANCY.

This subject, of so deep interest to the practitioner, is at present occupying the attention of a large number of British and foreign obstetricians. Sixteen years ago there appeared in the *Journal* the now celebrated paper by Dr. Copeman, which was read all over the globe, and gave his name to the "method" or "practice" which he advocated. Copeman's method simply means dilatation of the cervix with the fingers. Undoubtedly it has proved of the highest service, whatever may be the precise nature of its action. Dr. Grailly Hewitt, whose work on "Severe Vomiting during Pregnancy" appeared last year, traces the disorder to flexions, with inflammatory changes in the uterus, the vomiting, when established, causing uterine impaction. Other authorities, such as Dr. Henry Bennett and Dr. Marion Sims, trust in the application of counter-irritants to the cervix. Dr. Amand Routh, in a paper read in April at a meeting of the Harveian Society, strenuously advocated the painting of the cervix with a strong solution of iodine. The believers in flexion and in counter-irritants explain the benefits of Copeman's practice in a manner favorable to their own theories; it necessitates pulling on the cervix, and thus remedies a displacement; it involves handling of the cervix, thus constituting in itself a form of counter-irritation. There may be truth in all these theories. Dr. W. A. Duncan's practice of applying cocaine to the cervix may act as a sedative; but here again the defenders of counter-irritation maintain that it really acts as a counter-irritant through the mechanical

disturbance of the cervix required for its application. There is also a purely therapeutic school of obstetricians who put their trust in bromides, menthol, and other drugs. It happens that all contending parties can lawfully claim long series of cures on undoubted clinical evidence. On this fact Ahlfeld, Kaltenbach, and other obstetricians base their theory that the uncontrollable vomiting of pregnancy is a pure neurosis ; it has been cured by sudden fright, or by anxiety about other matters besides the pregnancy. These observers, in turn, explain away all the other theories. Dilatation, counter-irritation, and rectification of displacements cure by acting on the patient's mind, they believe. Moral treatment alone may cure the vomiting. There remains, unfortunately, the fact that in many cases nothing stops the vomiting save termination of the pregnancy. The induction of labor is not without risk ; the practitioner is unwilling to resort to it when the vomiting has not lasted long, while later on the patient may be fatally enfeebled by constant sickness ; hence the gravity of the entire question becomes self-evident. No wonder so much is written on hyperemesis gravidarum, but much more remains to be done before anything like a sound routine practice, suitable to others than hospital obstetricians of extremely specialized experience, is established to the benefit of humanity and the comfort of the practitioner.—*British Medical Journal*, May 30, 1891.

ORIGIN AND RÔLE OF PUS-CELLS.

According to the Paris correspondent of the *Lancet* (May 30, 1891), PROFESSOR RANVIER made an interesting communication at a recent meeting of the Academy of Sciences on the origin and significance of pus-cells. He said that for some years past histologists generally were agreed that the cells of pus were none other than the white corpuscles of the blood, which had emigrated from the vessels at the time suppuration was set up. He found it difficult, however, to believe that the blood could yield in this way, and in a time comparatively short, the enormous quantity of pus found in many pathological conditions, such, for example, as the purulent infection of wounds, accidental and operative. That the white cells do emigrate in the manner generally accepted he had no doubt. This takes place under normal physiological conditions, while it is still more pronounced in certain pathological states not ending in actual inflammation, in the process of which it is of course abundantly evident. What his experiments led him to establish, however, was that pus-cells had also quite another origin,—viz., the transformation into lymph-cells of clasmatocytes, elements derived from migratory cells, which under the influence of irritation revert to an embryonic condition and proliferate rapidly. As to the *rôle* of the pus-cells, M. Metchnikoff has shown the importance of lymphatic cells in the combat of the organism against microbes. In simple inflammation determined by caustics, or other irritant agents, their *rôle* is not less important. They eliminate the dead elements, and thus prepare the way for the processes of regeneration.

TUBERCLE BACILLI IN DUST.

SCHNIRER records (*Wien. Med. Presse*) some very interesting observations in regard to the possible presence of bacilli in dust. On rinsing the dust from some grapes, bought on a warm day, late in the summer, he found the water afterwards quite dirty. Struck by the thought of the large number of phthisical patients who eject their sputa upon the streets, he injected 10 cubic centimetres of this water into the abdominal cavity of each of three guinea-pigs. One of the animals died in two days of peritonitis. The other two died in forty-five to fifty-eight days, respectively. Examination of the bodies disclosed pronounced tuberculosis, originating in the site of inoculation, and partially caseous nodules in the peritoneum, in the liver, and in the spleen, with but meagre deposits in the lungs. Tubercle bacilli were found in the nodules. Schnirer concludes that the conveyance was by means of the dust, as the water used was the pure spring water of Vienna, and the glass receptacle containing the water, the doctor's hands, and the syringe with which the injection was made had been previously sterilized. He assumes, though without direct evidence, that the vender from whom the fruit was obtained was healthy. The point Dr. Schnirer makes is that tubercle bacilli may be in the dust of public streets, and may be attached to fruit or other articles exposed for sale and afterwards used for food. This fear seems to be exaggerated and contrary to the inference deducible from Cornet's investigations, for Cornet failed to find bacilli in street dust.—*Druggists' Circular*, June, 1891.

THE VALUE OF THE PHYSICAL SIGNS AT THE APICES OF THE LUNGS IN SUPPOSED INCIPIENT PHTHISIS.

It is a fact well known to physicians generally that in health the percussion note at the apex of the right lung may occasionally be of higher pitch than that of the left apex. An examination of one hundred healthy symmetrical chests by DRS. FUSSELL and ADAMS, on the other hand, show that,—

1. A normal condition at the right apex may be considered a diseased condition.

2. A diseased condition at the right apex may be considered normal.

3. The normal disparity in favor of the right apex may mask diseased conditions at the left apex.

In the *University Medical Magazine* for June, 1891, these authors publish a tabulated list of one hundred cases, taken as they presented themselves at the dispensary of the University of Pennsylvania, the diseases for which these cases were under treatment having no influence on the condition of the lungs.

When it is taken into consideration that the usual site of tubercular infiltration is at the apex of the lung, and that among the first signs of consolidation of the lung are higher-pitched percussion note, increased tactile fremitus and vocal resonance, the importance of the determination of the value of these signs is at once apparent. Of course there are other signs of incipient phthisis; one of which, prolonged expiratory effort, is very suspicious of approaching consolidation, and is a phenomenon which is seldom misleading. It is in those cases where these other signs are absent, masked, or very slight that these variations spring into greater prominence. Again, undoubtedly, the higher-pitched note, when existing normally at the right apex, is perfectly resonant; it lacks the deadened quality noticed in commencing consolidation. Yet this difference in quality is hardest to distinguish in just those cases where the greatest doubt exists, so that practically this difference is of no use. It is of the utmost importance that signs which are perfectly normal should not be mistaken for those of diseased conditions. On the other hand, it is equally important that we do not overlook diseased conditions at either apex, considering the signs as those of health. In the incipient stage of phthisis, so vital is the diagnosis for the future of the patient, and so slight are the symptoms and signs, that every straw adds weight to the conception of the case. A positive diagnosis is demanded by patient and as eagerly sought by physician. The disease is presented in its incipient stage oftener to the practitioner than any other disease, as its symptoms and results are so well known to the laity. Hence, in the majority of normal lungs, we have conditions which at once add suspicion to our conception of cases in which incipient phthisis is feared.

In examining this table, consisting of the reports of the condition of fifty-eight men and forty-two women, we find that eleven, or eleven per cent., have the same percussion note at both apices; nineteen, or nineteen per cent., have slightly higher-pitched note at the right apex; and sixty-nine, or sixty-nine per cent., have markedly higher-pitched note at the right apex, while one was higher pitched at the left apex. In the ninety-two cases where vocal resonance was taken, ten showed no difference at the apices; fourteen showed slight increase at the right apex, and sixty-eight marked increase. In ninety-three cases where the tactile fremitus was taken, no difference was found in eleven cases, slight increase on the right side in twenty, while sixty showed marked difference. Two cases exhibited marked increase of fremitus at the left apex.

In pursuing the examination, as far as possible, the results were obtained separately by each observer, compared, and then obtained together. Many cases where slight variation occurred were verified in this manner. One observer percussed the chest, while the other listened in such a position as to be unable to tell which apex was being percussed. Any case in which there was any difference of opinion as to the existence of any variation was put down in the list as equal on both sides. All the ordinary rules of percussion and auscultation were observed. There was no desire to force cases into one class or the other; the attitude was simply to endeavor to find the exact truth on the subject.

Supposing a case to present itself with higher-pitched percussion note, increased tactile fremitus, and vocal resonance at the right apex, the question, of course, arises whether this is a diseased condition. One of three errors may be made,—

1. A normal condition at the right apex may be considered a diseased condition.

2. A diseased condition at the right apex may be considered normal.

3. The normal disparity in favor of the right apex may mask diseased conditions at the left apex.

It is accepted by physical diagnosticians that the larger size of the right bronchus accounts for the increase of vocal resonance and tactile fremitus, both being due to the same cause,—increased transmission of the voice-sounds. As to the reason of the higher-pitched percussion note at the right apex, there is less clear and united opinion. The note at the left apex ought, if anything, to be the higher pitched; the explanations of the contrary conditions existing are not satisfactory. One explanation is that the liver at the base of the right lung deadens the wave-sounds from the tissue above, while the hollow viscus, the stomach, serves more as a sounding-board for the left lung. The degree of ten-ion of the thoracic parietes and of the lung tissue itself may account for it, as the greater the tension the higher the pitch.

In conclusion, the authors affirm—

That higher-pitched percussion note, increased vocal resonance, and tactile fremitus are normal at the apex of the right lung as compared with the left; that this normal condition can occur in such a number of cases and to such a degree as to cause in many instances a diagnosis of consolidation at the right apex; that finally, in deciding doubtful cases, other signs besides these three are necessary to formulate a diagnosis; continued observation of cases, where other signs are lacking, being necessary to watch the possible development of actual disease.

The authors report in detail three cases, which illustrate the existence of these three possibilities of error.

CHANGES IN THE KIDNEY IN PHTHISIS.

The condition of the kidneys in phthisis has never been fully investigated. Several observers have described a fibroid condition. Becquerel and Rayher concluded that Bright's disease was very frequently associated with tubercular disease of the lungs. Peacock, in one hundred and seventeen cases of kidney-disease, found 30.7 per cent. of phthisis. Frerichs found that out of forty-two cases of Bright's disease six also suffered from phthisis. Bamberger stated that the disease was found in fifteen per cent. of those suffering from kidney-disease. In the *Centralblatt für Allgemeine Pathologie und Pathologische Anatomie*, February 1, 1891, DR. C. VON KAHLDEN publishes his results on the same subject. He is of opinion that slight degeneration of the renal epithelium is almost always found in active phthisis. It may, however, be so slightly marked that it is only visible on microscopic examination, and even then may be easily overlooked. The kidney may be either normal in size or somewhat enlarged. Macroscopically the following conditions are noticed: The surface of the organ is smooth and yellowish in color; the capsule peels easily; the cortex is usually slightly thickened, and also yellow in color; the medullary portion is pale. The microscopic changes chiefly affect the cortex, the parenchyma being first attacked. The epithelial cells undergo fatty degeneration, but are occasionally replaced by fresh epithelial cells. The interstitial changes are, therefore, secondary, and generally slight, and take the form of a small round-celled infiltration, and some increase of the connective tissue. The glomeruli also take part in the degeneration. The cortex is not uniformly affected, but the changes take place in patches. These lesions are evidently chronic, as is shown by the thickened capsule, the atrophy of some of the glomeruli, and the changes in shape of the epithelial cells of the tubules, these being altered from a club form to a cubical or cylindrical shape. Clinical symptoms which accompany the renal degeneration are unreliable. Albumen in the urine is rarely present. The author states that the condition is one of a chronic parenchymatous nephritis, and thinks that it may be caused by the poisonous products of the tubercle bacilli.—*Lancet*, May 23, 1891.

URIC ACID IN DISEASES OF THE NERVOUS SYSTEM.

In the quarterly journal, *Brain*, spring number, 1891, DR. HAIG gives an interesting and instructive *résumé* of the influence of uric acid upon the system, and particularly upon nervous tissues.

As is well known, Dr. Haig has given great attention to this subject, and has made the influence of uric acid on the human economy the subject of extended and careful investigation. His statements, therefore, should command attention, and we are sure that a brief *résumé* of his conclusions cannot fail to be of value to our readers. (*Cincinnati Lancet Clinic*, June 20, 1891).

He first quotes the statement of Sir A. Garrod, that "the causes which predispose to gout, independently of those connected with individual peculiarity, are either such as produce an increased formation of uric acid in the

system or lead to its retention in the blood." Dr. Haig's investigations have led him to discredit the former of these causes and to attribute all uric acid diseases to its retention in the blood and in the tissues. He prefers the terms uricæmia or uric-acidæmia to designate these conditions. He is in accord with Murchison in his description of lithæmia as the symptomatology of uric-acidæmia, but does not attribute these to disturbed action of the liver, holding that the liver symptoms are concomitant or secondary and are the results of excess of uric acid, and he further believes that this excess is due to the failure to excrete it in the normal proportion of one to thirty-three of urea.

His investigations relating to the causation of migraine are detailed at considerable length. His attention being called to the relation of migraine to gout by Liveing and others, he discovered that the urine secreted during a headache always contains a considerable excess of uric acid in the proportion of one in twenty or one in twenty-five to the urea, while that excreted immediately before the attack of headache began contains a diminished quantity,—one in forty to the urea. Aching pains in the limbs, lassitude, and depression of spirits he finds quite common in uric-acidæmia.

Noting the statement of Sir A. Garrod as to the action of beer and wine in producing gout, he tested these and found them strongly acid. This led him to experiment with acids and alkalies, and, as he says, "I found, to my surprise, that I was able to alter the excretion of uric acid in either direction at pleasure." He then soon found that he could, by influencing the excretion of uric acid, also influence the headache as well, acids relieving or removing the headache, while alkalies made it worse. He also found that by giving acid for a day or two he could store up the uric acid in the tissues, and then by giving an alkali could wash it out into the blood and urine and bring on an attack of headache at will.

Since that time he has been able to show "that if uric acid is previously removed by a course of salicylate of sodium, a dose of alkali will produce neither a plus excretion of uric acid nor a headache." From this he infers that the headache is proportional to the uric acid in the urine, and "that the amount of this in the urine may be regarded as an index of the amount in the blood."

The relation of migraine to epilepsy led him to investigate this disease, in which he found a minus excretion of uric acid preceding a fit and a plus secretion accompanying.

The relation of mental depression and mental exaltation to this variation in uric acid excretion also engaged his attention. He was able to connect the exaltation with its diminished excretion, and depression of spirits with its increase.

The "intense and persistent coldness of the hands and feet in an attack of migraine" led him to note "that the pulse was slow and the vessels full during the attack." The tracings which he has accumulated conclusively prove, as he thinks, that he has "practically complete power over the rate and tension of the pulse." He states that "arterial tension varies with the amount of uric acid in the blood when combined with alkali (soda or potash), but is little affected by it, even though present in considerable quantity, if combined with a salicylate (salicyluric acid)." He thinks that opium produces its well-known effects on the mental condition through its effect on the circulation of the brain, which is secondary to its effect on uric acid, and that this depends on its influence on the alkalinity of the blood, and so on the solubility of the uric acid.

The chief substances which diminish the excretion of uric acid in the urine are "acids, iron and lead, and opium, and those which increase it are soda or potash under certain conditions, phosphate of sodium and salicylates." Mercury, he states, also markedly reduces the excretion of uric acid in the urine, reduces the tension of the pulse, and produces diuresis.

In the removal of the uric acid headache, which he thus attributes to the local vascular effect of the uric acid upon the blood-vessels of the brain, he places great value upon a regulation of the diet, "one of which milk, fish, and eggs constitute the only animal food completely removing the attacks, and without the use of any drugs whatever." "I believe that a man eating meat three times a day, and drinking acid beer and wine, may keep back and store up in his body several ounces of uric acid in a few years, while on the above diet he would not store up as many grains."

He mentions that Professor Lange, of Copenhagen, connected certain conditions of periodical depression with the uric acid diathesis, and treated them successfully by a diminution of meat foods, etc., and that Dr. Broadbent notices the frequent association of melancholia and mental depression with high tension of the pulse, and records their successful treatment by the milk diet. He believes that "many a case of suicide, and some murders, might be prevented by a timely dose of acid which would free the brain circulation from the power of the acid."

HOW TO GET A SUGARLESS MILK.

Milk is usually forbidden diabetics on account of the sugar (galactose and dextrose) which it contains. DR. A. E. WRIGHT has discovered a method of making sugarless milk (*British Medical Journal*). Take a quantity of milk, dilute it with three or four volumes of water, to which 1 to 2 parts per 1000 of acetic acid have been added. This produces a precipitation of all the casein and fat of the milk. The precipitate is allowed to settle for a few minutes, and then strained through a piece of calico. The precipitate is then washed, and redissolved in a one per cent. solution of the following mixture of salts:

	Parts.
Sodium chloride	11.5
Potassium chloride	9.9
Monopotassium phosphate	13.8
Dipotassium phosphate	10.0
Citrate of potassium	5.9
Dimagnesium phosphate	4.0
Magnesium citrate	4.4
Dicalcium phosphate	8.0
Tricalcium phosphate	9.6
Calcium citrate	25.5
Calcium oxide	5.5
Sodium carbonate	40.0

A trace of saccharin may be used to sweeten the milk, and the salt solution is best used at about blood temperature, and the casein and fat precipitate is to be mixed up with it, as in making cocoa, to the desired thickness. We obtain by this easy method a very fairly palatable and entirely sugarless milk. The precipitated casein and fat can also be dried without undergoing alteration, and then used for the preparation of the milk.—*Medical Record*, May 30, 1891.

Reviews.

TWELVE LECTURES ON THE STRUCTURE OF THE CENTRAL NERVOUS SYSTEM. FOR PHYSICIANS AND STUDENTS. By Dr. Ludwig Edinger, Frankfort-on-the-Main. Second revised edition, with 133 illustrations. Translated by Willis Hall Vittum, M.D., St. Paul, Minn. Edited by C. Eugene Riggs, A.M, M.D. Philadelphia: F. A. Davis & Co.

The first thing in this volume that strikes us, as reviewers accustomed to the fine work of some of our larger medical publishing houses, is the appearance of cheapness which everywhere haunts the surface, both printed and figured, of the pages; but when we look at the accompanying card we find that the price of the book is only a dollar and seventy cents, and so, as the type is after all clear and easily read, we are in a measure reconciled. Nevertheless, the physical degradation of our literature, which was specially introduced into medical literature by the so-called Wood's Library, and which is spreading slowly, seems to trend towards loss of dignity in the profession. It will be bad for our profession when "cheap and nasty" become familiar bywords in thoughts concerning it. We suppose that the plates of the present volume are photographic reproductions of the originals. They are too ugly and coarse to be the originals themselves; and unless they are photographic work, there is no excuse for the translator translating the text and not translating the figures. What is a "Stabkranz," or a "Rückenmark," or a "Schleife," or a "Haube," or a "Fuss," or a "Hinteres Längbündel," to say nothing of a "Körnerschicht," or a "Oberflächliches Mark," to the native citizen who proudly unfolds the stars and stripes to the wondering world, and defies alike English naval armament, German artillery, and Teutonic polysyllables!

We have no fault whatever to find with the text of the book. We believe, so far as we have been able to grasp it in these holiday months, that it is clear and correct. The sentences are short, direct, and free from that hopeless involution which so delights many a German intellect and so absolutely exasperates the simple convolutions of an Anglo-Saxon.

Correspondence.

BERLIN.

(From our Special Correspondent.)

Koch's Present Occupation—The New Koch Institute—A Joke of Professor Brieger—Henoch *versus* Koch—Lamentable Condition of German Physicians—Philadelphia Diplomas—Professors Mosetig and Adamkiewicz join the Discoverers of Secret Cures—A Secret Remedy against Warts—An Explosion with Chromic Acid.

Although we are done with Koch, Koch is not yet done with us. It cannot be expected from a man with Koch's energy and mind that a failure, however momentous, should act as a discouragement. Koch firmly believes in the ultimate success of his cure and in his mission to relieve mankind from one of the greatest scourges. In fact, a new and startling publication of the professor will be

issued shortly. Ever since his return from Egypt, Koch has been at work day and night in his private laboratory with tuberculin. I am privileged to state that just now Koch has succeeded in isolating the active principle of tuberculin. The new publication will also contain exact directions about the method of preparation, so that every chemist having a knowledge of bacteriology will in future be enabled to prepare the remedy. Koch feels confident that after isolation of the active principle tuberculin will be entirely void of a dangerous element.

Meanwhile, the seven barracks constituting the "Koch Institute" have been completed, and will be inaugurated next week with considerable ceremony. Every visitor entering Berlin by the Elevated, which passes close to the Charité campus, notices the long line of white and curious-looking barracks, and cannot but inquire as to their use. Alongside of the seven barracks destined for the reception of patients there are two for nurses, one for disinfection and autopsies each, one for coal and ice, and one for the officials of the institution. There are one hundred and eight beds in all. Great care has been used to protect the buildings against deleterious agencies emanating from either soil or atmosphere by undermining and protecting them with beton and gypsum plates of considerable thickness. Each room is surrounded by an empty chamber to insure perfect ventilation, and the walls consist of oiled enamel to facilitate their cleaning.

Allow me to insert here a little anecdote concerning Professor Brieger, Koch's successor in the Hygienic Institute. A distinguished foreign physician paying a visit to the Institute found the professor busily at work in the laboratory surrounded by the most formidable array of chemical and bacteriological utensils. The professor's sole attention and care, however, appeared concentrated on one particular vessel which was enveloped by smoke and steam. "Guess what I am boiling here," said the professor to the visitor. The latter began to enumerate the entire scale of microorganisms from the cocci to the spirochetæ. "No, sir," quoth Brieger, "these are hot sausages."

A few days ago I had an opportunity to listen to a clinical lecture of Professor Henoch, in which the latter stated his reasons why he had taken a firm stand against the Koch remedy. "This child, gentlemen," said the professor, presenting a girl of about 10 years of age, who had come to the polyclinic, "is a victim of tuberculin. Last year, during the 'Koch epidemic' [Henoch's own words], the patient was sent to us by an eminent physician to be subjected to the new treatment. Physical examination and subjective appearances did not point to tuberculosis, but an occult tubercular process was taken for granted, all the more as the patient reacted regularly to the injections. The patient got on pretty well and evenly until suddenly she began to cough up pus. This symptom, alongside of bronchial breathing and a suddenly-appearing dulness at the base of the right lung, were the evidences that we had to deal here with abscess of the lung, as the result of tuberculin injections. The abscess had not yet healed after the lapse of six months, as the patient was still occasionally coughing up pus." Ever since that experience, Henoch stated, he was a decided adversary of the Koch cure, and as long as he presides over the pediatrical department of the Royal Charité tuberculin will not be tried again.

The Berlin physicians are just now greatly agitated by the question of "Krankenkassenaerzte" (physicians of sick-benefit societies). Hitherto a member of such a society was compelled to consult the doctor of the society, who received a yearly salary for his services. As all Berlin workingmen and working-women are legally compelled to belong to a sick-benefit society, the work of doctors elected by such societies is naturally an enormous one. Their houses are actually besieged by patients, while hundreds of other physicians have no patients at all. The consultations which the "society doctors," as I will call them, grant to each patient are ridiculously short and absolutely incapable of benefiting the patients. I have heard of doctors "doing" over one hundred patients a day, and also learnt the number of minutes allotted to various consultations.

Minor surgical cases...	15	minutes.
Gonorrhœal affections.....	10	"
Headache and other pains...	5	"
Influenza.....	6	"
Rheumatism.....	6	"
Examination of the lungs....	5	" etc.

It is evident that this state of affairs is an improper one and equally undesirable for both patients and doctors. To enhance the morbid character of the affair, the compensation of the physicians is a ridiculously low figure,—viz., *eight Pfennige* (two cents) per consulta-

tion, on an average. This figure is no fancy of your correspondent's brain, but has been officially fixed by statistical investigations and has been published broadcast in all papers. Imagine the blissful state of the practitioner rewarded by two cents for an auscultation of the chest. At last the Berlin doctors have waked up and taken energetic steps towards extinction of this shameful condition.

"Striking doctors" is the latest acquisition of the day. In Dresden the "society doctors" refuse to grant consultations to members of the sick-benefit societies as long as Naturaerzte (natural physicians) are elected by the societies and put on an equal level with them. The societies are in despair, as they find no Dresden physician who would accept the office under the conditions mentioned. It is a singular fact that the so-called Naturaerzte are gradually developing a formidable competition to the regular physicians. Dietetic, hydropathists, and electric physicians flourish nowhere else more than in Germany. Possibly it is not known universally in America that the German physician is absolutely unprotected by the government since the introduction of Gewerbefreiheit (*i.e.*, trade-freedom, meaning license to carry on any trade or profession whatever). The government prosecutes all those carrying the title of "doctor" or "physician" illegally, but allows every barber and huckster to practise medicine. Apropos of the title "doctor," a hot fight between the government and a "doctor Philadelphiæ" has just come to an end. Hugo Ascher, doctor of dental surgery, a graduate of the University of Pennsylvania, wanted to "hang out" as Dr. Hugo Ascher. As in Berlin no shingle or sign can be put up without the sanction of the government, Dr. Ascher duly asked permission to put up his doctor shingle. The president of police, however, concluded that a man having a Philadelphia diploma is a fraud just as well as the "Philadelphia University," and on this ground interdicted the doctor shingle. The plucky Dr. Ascher, however, sued the president of police and was successful to a certain extent. His sign was allowed to read Hugo Ascher, Dr. of Dental Surgery, but he was forbidden from signing "Dr. Hugo Ascher." The stigma resting on all Philadelphia diplomas will probably not be taken off for some time. Your correspondent desired some time ago to take certain special courses at the Charité clinics and found it desirable to matriculate. He was surprised to find his title of doctor, which he had earned ten years ago at the University of Pennsylvania, ignored on his official matriculation papers. Seeing Professor Tabler, the rector of the University of Berlin, about it, your correspondent soon learned that a Philadelphia doctor was a humbug who evidently had no right to his title. All New Jersey or backwood diplomas are good in Berlin, while Philadelphia sheepskins remain a fraud. Would it not be indicated for Mr. Charles Meyer, the imperial German consul at Philadelphia, to notify the officials of the empire as to the character and worth of Philadelphia diplomas?

Now that Koch and Liebreich are quieted down, Professor Mosetig has taken the stump, and announces with great pathos and enthusiasm his new remedy against tuberculosis. The professor does not as yet divulge either name or nature of his new remedy, but merely states that it is quite harmless, and has both a local and constitutional reaction. Almost simultaneously Professor Adamkiewicz, of Cracow, announces his secret remedy against cancer. A number of cures are alleged to have been perfected by this remedy. I think it would be better for such celebrated men as Mosetig and Adamkiewicz if they would concentrate their mental abilities on a good remedy against coryza or influenza than pursuing a course where only disappointment and discredit await them. The profession will no longer listen to a consumption or cancer cure, no matter who is the discoverer.

Speaking of secret remedies, there is a specialist of warts in Berlin who in removing warts is eminently successful. His secret remedy consists in Fowler's solution, which he gives in weekly increasing doses to adults 2 drops three times a day, to children ½ a drop three times a day.

An explosion occurring here recently in a drug-store with chromic acid will interest all physicians. A physician prescribed

℞ Sol. acidi chromici, 10 in 200;
Acidi salicyl., .2;
Alcoholis, 15. M.

The druggist added the crystallized chromic acid directly to the alcohol, whereupon a violent explosion followed, destroying his eyes. The druggist ought to have known that chromic acid acts as a violent explosive when in contact with glycerin, ethereal oils, or alcohol, due to its extraordinary hygroscopic properties.

Notes and Queries.

THE AMERICAN SOCIETY OF MICROSCOPISTS.

This association, now in the thirteenth year of its existence, will hold its fourteenth annual meeting in Washington, D. C., August 10, and continue in session five days. Its roll of active members contains about three hundred and fifty names, embracing very nearly every person in the United States who is at all prominent as a microscopist. Its membership consists of two distinct classes,—viz., professional men and students of the natural sciences, who use the microscope in their daily avocations as an instrument of research, diagnosis, or precision; and amateurs, or those who find pleasure and profit in the revelations of the instrument. Many of the latter class, from having early chosen special lines of study and investigation, have acquired high reputations in their respective departments of microscopical research. In its earlier years this class predominated in the membership of the society, but at present the professional element is largely in excess.

The qualifications for membership are very simple. The applicant must be a respectable person socially, and interested in the use of the microscope. (*St. Louis Medical and Surgical Journal*, May, 1891.)

The advantages of membership are dual in their nature,—*i.e.*, general and social, or those which accrue to the individual from association with others engaged or interested in the same pursuits in any and all walks of life; and special, in that the meetings of the society are to a certain extent educational in their nature. In the "Working Sessions" experts in every department of microscopical technology are engaged in giving manual demonstrations of the details of their lines of work; in the informal evening "conversaziones" the room of every worker who has anything special to exhibit or demonstrate is open for the reception of all those who wish to witness the demonstration; finally, the *soirée* affords an opportunity of displaying for the benefit of the members, as well as the public generally, all that is most beautiful, interesting, and instructive in the cabinets or laboratories of the exhibitors. Of late years the *soirées* have been attended by many thousands of visitors in every city in which the society has met, and have been regarded as distinguished social as well as scientific events.

The dues are trifling, only two dollars per annum, and in return the member gets a volume of the Annual Proceedings, which costs very nearly this amount. These proceedings are elegantly and profusely illustrated with photo-engravings, autotypes, chromoliths, and wood-engravings, done in the highest style of art. There is scarcely a subject in the whole range of microscopical work upon which information may not be found by reference to the indexes of these volumes, and collectively they form a library of microscopy full of invaluable matter to the student and worker.

The railroads have of late years extended excursion or convention rates to and from the places of meeting, and, although no arrangements have as yet been definitely made, we can assure our readers that the Washington meeting will be no exception to the rule. Indeed, it is probable, from the fact of the meeting of the American Association for the Advancement of Science in Washington only three days after our adjournment, that a more than usually advantageous arrangement may be obtained.

The museums and libraries, as well as the many other objects of interest of the national capital and its surroundings, will be open to the visits of the members, and special facilities for seeing them will be accorded.

Special hotel rates will also be secured. An announcement of the railway fares, hotel rates, etc., will be made hereafter.

In view of the facts related, and from assurances that we have already received, we are justified in saying that there will be present the largest number of old members of the society ever in attendance at an annual meeting.

We invite and urge upon all persons, professional or amateur, interested in microscopy and not already on the rolls, to send in their applications for membership to the secretary, Dr. W. H. Seaman, No. 1427 Eleventh Street, Washington, D. C. The application should be accompanied by three dollars, which is the initiation fee and one year's dues. As it is more than probable that the initiation fee will be increased in the near future, it will be to the advantage of all who contemplate membership to send in their applications before the next meeting.

Any further information concerning the society or the approaching meeting may be obtained on addressing any of the following:

Frank L. James, President, Box 568, St. Louis.

W. H. Seaman, Secretary, No. 1424 Eleventh Street, Washington, D. C.

C. C. Mellor, Treasurer, No. 77 Fifth Avenue, Pittsburg, Pa.

QUININE ALBUMINATE.

A preparation described as being a homogeneous compound of egg albumen with quinine, possessing the remarkable property of not being decomposed by the strongest alkalies, has been recently introduced by M. Tarozyi (*Union Pharm.*, May, p. 196). It is claimed that the preparation is easily absorbable by the mucous membrane of the stomach and passes into the circulation, where it exercises its therapeutic properties without undergoing decomposition, under conditions in which the ordinary salts of quinine are broken up by the alkaline liquids of the system. This "albuminate of quinine" is stated to be prepared by double decomposition between sulphate of quinine and albuminate of soda, but the manner of operating is not indicated. The product is a white amorphous bitter substance, said to contain fifty-six per cent. of quinine; it is alkaline in reaction, dissolves more readily in hot water or alcohol than in cold, and more freely still in water acidulated with lactic or hydrochloric acid. It may be distinguished from other salts of quinine by treating it with water, acidulated with sulphuric acid, which forms with the quinine soluble acid sulphate, the albumen being precipitated after standing.—*Pharmaceutical Journal and Transactions*, May 30, 1891.

CHLORAL-PHENOL AND PHENOL CAMPHOR.

Chloral has the property, when rubbed with certain bodies, such as camphor, of forming therewith syrup liquids. With phenol (absolute carbolic acid) it also liquefies, and a preparation composed of equal parts of phenol and chloral is used in medicine for allaying toothache, as well as for its antiseptic properties. A recent study by FABINI, says the *Chemist and Druggist*, shows that chloral-phenol possesses the odor and taste of its constituents, and when applied to the skin produces inflammation and an eruption of small blisters. It is a colorless and clear liquid, having a sp. gr. at 20° C. of 1.289, so that it sinks in anhydrous glycerin. It is soluble in alcohol, acetic acid, amyl-alcohol, chloroform, carbon bisulphide, and glycerin, as well as in ether when slightly warmed. It is only partially soluble in petroleum ether, and benzine only dissolves a little of the fluid, and what is dissolved is chloral-phenol. Fabini tested the fluid thoroughly, with a view to determining whether it is a mechanical mixture, and it behaved in every way towards reagents as carbolic acid does, while with sulphuric acid some of the chloral-phenol yielded, after twenty-four hours, a velvet-colored plaster-like mass, which consisted of meta-chloral and phenol-sulphonic acid. There seems to be no doubt, therefore, that chloral-phenol is a mixture.

This preparation should not be confounded with the phenol camphor devised by Cockrane (not campho-phénique), and made by mixing together 1 part of carbolic acid and 3 parts of camphor. After twenty-four hours this becomes a liquid, having a sp. gr. of .990. It is used with oil as an antiseptic. As a spray it may be applied to the skin to produce loca-anæsthesia. It may be employed for disinfecting surgical instruments, and as wool and gauze for wound dressing. It is soluble in alcohol, ether, and oils, but not in water or glycerin. Menthol, cocaine, salicylic acid, iodoform, chloral hydrate, and mercuric chloride are soluble in phenol camphor.—*Pharmaceutical Record*, June 11, 1891.

ELIMINATION OF IRON BY THE BILE.

That iron is present in the bile has been known for a long time, but the exact quantity eliminated by this channel and its significance have perhaps been exaggerated by some physiologists. Hamburger's researches, although ten years old, are still of great importance, for he established the fact that the largest part of the iron introduced into the body, either naturally in the food, or given in the form of preparations of iron, is eliminated in the fæces, a very minute trace by the urine, and excessively little by the bile. Thus a dog, in the course of thirteen days, received 180 milligrammes of iron, and in the same time 136.3 milligrammes were eliminated by the fæces, 38.4 milligrammes by the urine, and 1.8 milligrammes by the bile. He also showed that the iron eliminated by the bile is but little influenced by variations in the amount of iron introduced by the mouth, so that the iron in the bile must be regarded as an index of the hæmatopoietic or hæmatolytic action of the liver. DASTRE (*Archives de Physiologie*) subjected a large dog, with a bil-

iary fistula, to a strict dietary, and collected most carefully the bile excreted daily. He finds that the proportion of iron in the bile excreted is very variable. As a mean, it is .94 per cent. of the dry residue, although there are very considerable variations even in a regular and exactly similar diet, so that Dastre also finds that the hepatic iron depends more on the blood formation or blood destruction in the liver than on the alimentary conditions. The quantities of iron excreted in the bile of a dog weighing 25 kilos (55 pounds) vary from 2.34 to .09 milligrammes per day per kilo weight of the animal.—*Medical Record*, June 13, 1891.

NEW METHOD OF TREATING VARICOSE VEINS.

At the German Surgical Congress, DR. LANDERER, of Leipsic, communicated the details of a new method of treating varicose veins. This consisted in the application of a kind of truss, that was applied like a garter, and by its permanent pressure on the saphena vein effected a cure. Pressure was obtained by an india-rubber pad situated on the inner surface of the truss and filled with water. The pressure was constantly kept up until the wall of the dilated vein was ulcerated through. He had adopted this method of treatment from an observation of a deceased colleague, Herr Ravoth, who treated varicoceles by the application of a truss. Professor Bardeleben remarked that Ravoth had himself often told him that his cures of varicocele had not been permanent; he feared that Landerer's procedure would not effect a lasting cure.—*Medical Press*, June 13, 1891.

MUSHROOMS AS FOOD.

The alarming symptoms which occasionally follow the use of fungi when taken as food are familiar to most of our readers. The risk in this particular, however, is less than it might be. In actual market custom we recognize but a very few forms of edible fungi, though it must be allowed that even in these we are liable to deception of a somewhat dangerous kind. It is therefore a matter of some importance that the public mind should be informed as far as possible of the qualities which distinguish the edible from the poisonous varieties. To give a precise definition which would also be comprehensive is, however, no simple matter, and as a matter of fact the number of edible fungi, even in this country, is much greater than is commonly understood. It may be said, however, that a high color, a scaly or spotted surface, and tough or watery flesh are usually associated with poisonous properties, while the edible species are but seldom highly colored, scaly, or spotted, but usually white or brownish, and brittle on fracture. The former, moreover, grow clustered on wet or shady ground, the latter singly in dry pastures. The common British mushroom is known by its pink hymeneum or gills. Fungi which have a bitter or styptic taste, or which burn the fauces, as well as those which yield a pungent milk, those of livid color, and those which on bruising assume various hues, ought to be avoided. It should be remembered also that all plants of this class readily undergo decomposition, and should therefore be eaten as fresh as possible.—*Lancet*, May 30, 1891.

INCOMPATIBILITY OF COCAINE AND BROMIDE OF SODIUM.

In *La Pratique Médicale* for June 19, 1891, it is stated by M. L. RACINE that having to prepare a solution of bromide of sodium and hydrochlorate of cocaine, on dissolving these substances in water and mixing them a grumous precipitate was formed, which gradually rose to the surface of the liquid. It seems that this precipitate is actually the cocaine, which is thrown out of solution, and the dangers of such a mixture are self-evident, for the cocaine floating on the top of the mixture would be given in a larger dose than was intended.

CONDITION OF VASCULAR TENSION IN PULMONARY PHTHISIS.

At the meeting of the Société de Biologie, held on May 16, 1891, DR. MARFAN (*Le Progrès Médical*, May 23, 1891) stated as a result of his investigations by means of the sphygmomanometer of Potain that in all cases of pulmonary phthisis, whether in a febrile state or not, whether under the influence of drugs or not, arterial tension is notably and constantly diminished. Instead of registering a pressure of seventeen to eighteen centimetres of mercury, the normal blood tension, under such circumstances the pressure oscillates between fifteen and ten centimetres. Fever and the cachexia of advanced stages of phthisis still further diminish this condition. The author finally calls attention to the fact that this diminution in arterial tension is not

only a constant phenomena, but is a very early sign of phthisis, and thus is worthy of attention from a diagnostic point of view.

OSMIC ACID IN GOITRE.

In the *Journal of Laryngology and Rhinology* for June, 1891, there is published the account of a female patient under the care of Dr. S. H. Auerbach, who was treated by parenchymatous injections of osmic acid, local massage (fifteen minutes' *séances* once daily), and internal administration of iodide of potassium. The acid was employed in the shape of an aqueous solution (one grain of crystallized acid to two drachms of water), a syringeful of which was injected once daily, or every other day, for three weeks. By the end of the period the tumor decreased one-half, while all subjective symptoms disappeared. The author believes that the method should be preferred to excision, since it is free from such dangers as the development of cachexia strumipriva, etc.

THERAPEUSIS OF LOCOMOTOR ATAXIA.

According to the Paris correspondent of the *Lancet* for June 6, 1891, at a meeting of the Société de Biologie held on the 23d ult., M. Depoux communicated a case of locomotor ataxia successfully treated at the Val de Grâce military hospital by injections of testicular juice after the method of Brown-Séquard. The symptoms noted were inco-ordination of movement, absence of patellar reflex, enfeeblement of sexual power, loss of muscular sense, slight amblyopia, and lightning pains in the lower limbs. After having been subjected without benefit to the usual methods of treatment—electricity, suspension, thermo-cauterization, large doses of potassium iodide, etc.—Brown-Séquard's famous juice was tried and the symptoms all disappeared. Even the knee-jerk reappeared, and the man is reported to be now strong and well. In criticising the conclusions of M. Depoux, M. Dejérine doubted the existence in this case of actual sclerosis of the posterior columns, believing that we had to deal rather with pseudo-tabes of peripheral or dynamic origin. M. Babinski reminded the society of the occasional occurrence of recovery from tabes, and he cited the case of a woman, ataxic for twenty-three years, who for five years before death had lost her lightning pains, gastric crises, atrophy of the optic nerves, etc. At the necropsy the accuracy of the diagnosis was amply confirmed. It is to be noted, however, that in this instance the knee-jerk remained permanently suppressed. M. Dejérine recalled the observation first made by Benedikt, that when tabes dorsalis commences with amaurosis, ataxic symptoms rarely manifest themselves, atrophy of the disk appearing to exercise an inhibitive influence on the spread of the sclerotic process in the posterior columns.

AVOIDANCE OF STIMULANTS DURING HEMORRHAGE.

It is customary, when the accident of hemorrhage occurs, for the operator, or some by-stander, to administer wine, brandy, or some other alcoholic stimulant to the patient, under the false idea of sustaining the vital power. It is my solemn duty to protest against this practice on the strictest and purest scientific grounds. The action of alcohol, under such circumstances, is injurious all round. It excites the patient, and renders him or her nervous and restless. It relaxes the arteries, and favors the escape of blood through the divided structures. Entering the circulation in a diluted state, it acts after the manner of a salt in destroying the coagulating quality of the blood; and, above all other mischiefs, it increases the action of the heart, stimulating it to throw out more blood through the divided vessels. These are all serious mischiefs, but the last named is the worst. In hemorrhage the very key-stone of success lies so much in quietness of the circulation that actual failure of the heart, up to faintness, is an advantage, for it brings the blood at the bleeding-point to a stand-still, enables it to clot firmly, when it has that tendency, and forms the most effective possible check upon the flow from the vessels. Dr. Richardson (*Asclepiad*, No. 29, 1891), refers to a case in which three pounds of blood was lost and the patient was unconscious, but which recovered. He refers to this case as typical, because, if a stimulant were not wanted in it, a stimulant cannot be called for in examples less severe. The course followed was simply to lay the patient quite recumbent when signs of faintness supervened, and, so long as he could swallow, to feed him with warm milk and water freely. Such, in my opinion, is the proper treatment to be employed in every instance of syncope from loss of blood.—*Dietetic Gazette*, June, 1891.

TREATMENT OF FLATULENCE.

Flatulence is a trouble that sometimes defies medical treatment. A French journal recommends the following:

℞ Naphthol, ʒi;
Carbonate of magnesium, ʒi;
Powdered charcoal, ʒi;
Essence of peppermint, gtt. ii.

This is to be divided into fifteen powders, and one taken at the beginning of each meal.

When the flatulence is accompanied by constipation the following may be used:

℞ Magnesium sulphate, ʒi;
Flowers of sulphur, ʒi.

To be made into fifteen powders, one of which is to be taken at each meal.

When diarrhœa accompanies the flatulency:

℞ Bicarbonate of sodium, grs. xxx;
Prepared chalk, grs. xv;
Powdered nux vomica, grs. iii.

May be made into ten powders, one of which is given with each meal.

—*Pharmaceutical Record*, June 18, 1891.

THE CAUSE OF ANÆMIC HEART-MURMURS.

Anæmic heart-murmurs have been the subject of various ingenious explanations. The one given by the best text-books for a long time was a morbid condition of the blood, an explanation good as far as it went, but one that did not go very far. Recent investigations make it probable that these murmurs are due to a weakness of the papillary muscles of the heart, by which the curtains of the mitral and tricuspid valves are relaxed and so give rise to an adventitious sound. Experiments show that when in the death of an animal the heart gradually fails, the contraction of the papillary muscles lags more and more behind that of the ventricular wall, and ceases entirely some time before the rest of the heart stops beating. On account of their situation the papillary muscles are the part of the heart wall likely first to feel the effects of a decreased blood-supply in anæmia; corroborative evidence of this theory is found in the fact that in acute anæmia and other conditions of sudden and great weakness a heart-murmur is often to be detected, but disappear, upon compression of the iliac vessels or abdominal aorta, or upon the administration of alcohol or digitalis to strengthen the heart beat.—*Northwestern Lancet*, June 15, 1891.

THE SECOND TRIENNIAL SESSION OF THE CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS.

The Commitee of Arrangements takes great pleasure in announcing to the members and invited guests that the arrangements are sufficiently advanced to assure the success of the Second Triennial Session of the Congress of American Physicians and Surgeons, which will be held in Washington during the 22d, 23d, 24th, and 25th of September, 1891.

A number of distinguished physicians and surgeons from abroad have accepted the invitation to attend, among whom may be named Mr. Thomas Bryant, Mr. B. E. Broadhurst, Mr. A. E. Durham, Mr. Reginald Harrison, Surgeon-General Sir W. E. McKennin, Mr. U. Pritchard, Mr. F. Treves, Sir William MacCormac, and Drs. James G. Glover and William M. Ord, of London, England; Drs. McCall Anderson and W. T. Gairdner, of Glasgow; Mr. E. H. Bennett and Professor J. J. Cunningham, of Dublin; Professor John Chiene and Dr. J. Battey Tuke, of Edinburgh; Professor H. Krause and Dr. F. Beeby, of Berlin; Professor Curschmann, of Leipsic; Professor Hoffa, of Wurzburg; Professor Kuhne, of Heidelberg; M. Emil Juval, M. E. Landolt, and Dr. Pozzi, of Paris; Dr. A. Musso, Turin; Dr. Von Mozengeil, of Bonn; Dr. Lowenber, of Paris; and Dr. Rafail Lavista, of Mexico.

The sessions of the Congress will be held in the Main Hall of the Grand Army Building, 1412 and 1414 Pennsylvania Avenue, from 3 to 6 P.M. daily.

The President's address will be delivered in the Lecture Hall of the National Museum, Wednesday, September 23, at 8 P.M., followed by the reception of the President, from 9.30 till 12. Order of Executive Committee. The Army Medical Museum will be open the same evening.

The sessions of the Societies will be held according to the programmes of each, respectively, in the places as follows:

American Surgical Association, Main Hall, Grand Army Building, 1412 and 1414 Pennsylvania Avenue.

Association of American Physicians, Hall No. 1, Grand Army Building, 1412 and 1414 Pennsylvania Avenue.

American Climatological Association, Hall No. 2, Grand Army Building, 1412 and 1414 Pennsylvania Avenue.

American Gynæcological Society, Lecture Hall, Columbian University, Fifteenth and H Streets N. W.

American Laryngological Association, Parlor A, Arlington Hotel.

American Neurological Association, Parlors 182 and 183, Arlington Hotel.

American Orthopædic Association, New Reception-Room, Arlington Hotel.

American Otological Society, Ladies' Parlor, No. 1, Arlington Hotel.

American Ophthalmological Society, Ladies' Parlor, No. 2, Arlington Hotel.

American Physiological Society, Parlor 181, Arlington Hotel.

The officers of the American Dermatological Association and the American Association of Andrology and Syphilology have made their arrangements with the Shoreham for places of meeting.

Office of Registration, Parlors 1 and 2, Arlington Hotel. From this office the mail of members and guests will be distributed, and the city residence of each member or guest can be ascertained.

The Association of American Anatomists will meet in this city during the sessions of the Congress, and will occupy Hall No. 3, Grand Army Building. The American Pediatric Society will meet here September 23 and 24 in the Lecture Hall of Columbian University, Fifteenth and H Streets N. W.

The Congress will be composed of the members of the constituent Societies and invited guests.

A registration fee of five dollars will be required of every member of the constituent societies who may register; invited guests will not pay the fee. Order of Executive Committee.

Participating Societies can "accredit visitors to the Congress, who shall pay the registration fee, but shall not be privileged to participate in the deliberations of the Congress." Order of Executive Committee.

A copy of the Transactions of the Congress will be sent to each person who may register.

Only those who may register, invited guests, and ladies accompanying them will be admitted to the Reception of the President.

Secretaries of constituent Societies are requested to supply this Committee with the names and addresses of "accredited visitors."

The evenings of Tuesday, September 22, and Thursday, September 24, are left to the Societies.

Members of the American Surgical Association and of the Association of American Physicians will conjointly entertain their foreign guests at dinner at the Arlington Hotel, Thursday, September 24, at 8 P.M.

The American Gynæcological Society has also arranged for a dinner at the Arlington Hotel, Thursday evening, September 24. The American Pediatric Society give a dinner September 24.

Other Societies that intend to entertain their foreign guests are requested to communicate with this Committee.

Arrangements are in progress to secure reduction of railway fares. As soon as completed, the information will be communicated to each member and "accredited visitor."

The Arlington Hotel offers accommodations at the rate of four dollars per day, and the Hotel Arno offers rates "on the American plan, at three and four dollars per day; on the European plan, one dollar each per day. Exclusive use of bath, one dollar extra."

A blank certificate of registration will be sent to each member and "accredited visitor." The Committee requests each person receiving such certificate to fill the blanks and return it, with the fee, to Dr. John S. Billings, Treasurer of the Congress.

The American Pomological Society, and perhaps other Societies, will meet in this city, September 22 to 25. The Committee, therefore, suggest to the members an early arrangement for hotel accommodations.

Inquiries relating to railway fares must be addressed to Dr. S. S. Adams, 1632 K Street.

A complete roster of membership of the Congress has been prepared, with post-office address and Society to which each member belongs.

The Committee will take pleasure in answering any inquiry relating to the local arrangements of the Congress.

Samuel C. Busey, M.D., *Chairman*, 1545 I Street N. W.

John S. Billings, M.D., Army Medical Museum.

W. W. Johnston, M.D., 1603 K Street N. W., Washington, D. C.

R. T. Edes, M.D., 1214 Eighteenth Street N. W., Washington, D. C.

S. O. Richey, M.D., 732 Seventeenth Street N. W., Washington, D. C.

J. Taber Johnson, M.D., 1728 K Street N. W., Washington, D. C.

I. E. Atkinson, M.D., 605 Cathedral Street, Baltimore, Md.

C. F. Bevan, M.D., 807 Cathedral Street, Baltimore, Md.

Samuel Johnson, M.D., 204 Monument Street, Baltimore, Md.

Samuel Theobald, M.D., 304 Monument Street, Baltimore, Md.

H. Newell Martin, M.D., Johns Hopkins Hospital, Baltimore, Md.

D. Forest Willard, M.D., 1818 Chestnut Street, Philadelphia, Pa.